IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

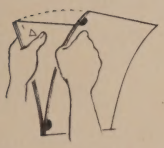
This PHOTOFACT Folder Set is

WIRE-SEALED FOR YOUR PROTECTION

to guarantee completeness of contents

DO NOT ACCEPT IF SEAL HAS BEEN BROKEN

TO OPEN ***JUST DO THIS:***



1

Take hold of the Set with both hands. Place your thumbs directly under the top wire-seal; then, divide the contents equally by putting your thumbs midway through the thickness of the Set. Now, pull the two sections apart at the top, firmly.

2

Repeat this process, pulling close to the wire-seal at the bottom, so that the set is now divided into two equal parts.

3

Continue this "pulling-apart" process with the section in which the wire-seals remain, dividing it in half.

4

Finally, remove the wire-seals left in the last section; this can easily be done with your fingernail or any sharp instrument.

Your "Safety-Sealed" PHOTOFACT Set is now ready for profit-making use . . .

IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

The PHOTOFACT® Servicer

SET 526 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ APRIL 1961

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This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

IN THIS ISSUE OF THE SERVICER:

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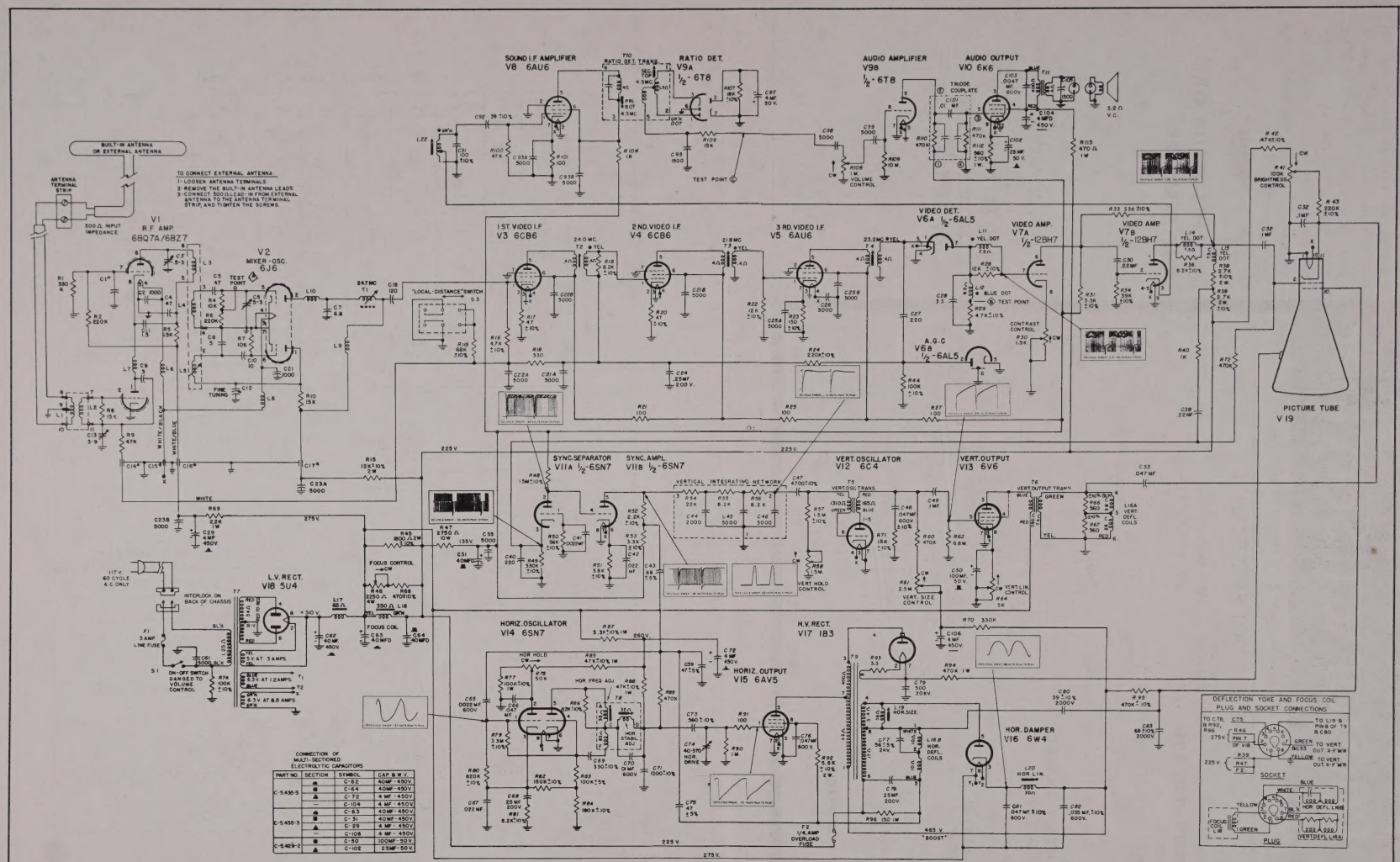
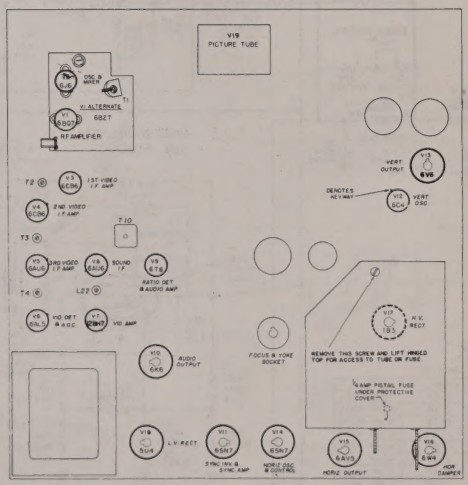


MAJESTIC MODELS 78, A, 79, 81, 82, 83, 84, 85, 86, 88 (SERIES 123-17, 124-21, 124-2-21)

Schematic Diagram Courtesy of Majestic Radio & Television

TUBE COMPLEMENT AND VOLTAGE CHART

Symbol	Tube Type	Pin No. 1	Pin No. 2	Pin No. 3	Pin No. 4	Pin No. 5	Pin No. 6	Pin No. 7	Pin No. 8	Pin No. 9
V1	6BQ7	165	−1	0	6.3AC	0	265	160	165	0
V2	6J6	75	135	6.3VAC	0	−3 to −5	−4 to −9	0	—	—
V3	6CB6	−1	.55	0	6.3AC	100	100	0	—	—
V4	6CB6	−1	.55	0	6.3AC	101	101	0	—	—
V5	6AU6	0	0	0	6.3AC	102	102	1	—	—
V6	6AL5	0	−.75	6.3AC	0	0	0	−.35	—	—
V7	12BH7	152	0	0	6.3AC	6.3AC	57	−.35	0	—
V8	6AU6	0	0	0	6.3AC	105	105	.9	—	—
V9	6T8	−.35	−1.7	−.35	6.3AC	0	0	0	−.35	40
V10	6K6	NC	0	210	219	0	N.C.	6.3AC	14	—
V11	6SN7	0	28	2.4	28	74	28	6.3AC	0	—
V12	6C4	144	0	0	6.3AC	144	−34	0	—	—
V13	6V6	NC	6.3AC	275	275	−24	—	0	5	—
V14	6SN7	−3.5	175	12	−65	188	0	0	6.3AC	
V15	6AV5	−25	6.3AC	0	—	Do Not Measure	—	0	145	
V16	6W4	NC	NC	470	—	225	—	290	290† 6.3AC†	
V17	1B3	13.5KV*	13.5KV*	13.5KV*	—	13.5KV*	—	13.5KV*	13.5KV*	
V18	5U4	NC	310** 5.0AC	NC	305AC	290	305AC	290	310	
V19	CRT	0	5	Pin 10 365		Pin 11 33		Pin 12 6.3AC		



NOTES FOR VOLTAGE CHART

1. Tune receiver to unused chan. — no signal applied.
2. All front panel controls at maximum clockwise position.
3. Screwdriver service adjustments — adjusted for normal raster.
4. Maintain line voltage at 117 volts A.C.
5. All voltage measured with V.T.V.M. unless otherwise specified.
6. Values shown are D.C. voltages measured from socket to ground unless otherwise specified.
7. N.C. designates no connection.
8. A dash designates the non existence of socket connections.
9. "Local distance" switch in "local" position.

* Use high voltage insulated probe only.
† Top value is D.C. voltage to ground. Bottom value connect A.C. meter across socket connections 7 and 8.
** Top value is D.C. voltage to ground. Bottom value connect A.C. meter across socket connections 2 and 8.

PHOTOFACT® Folder with CIRCUITRACE®

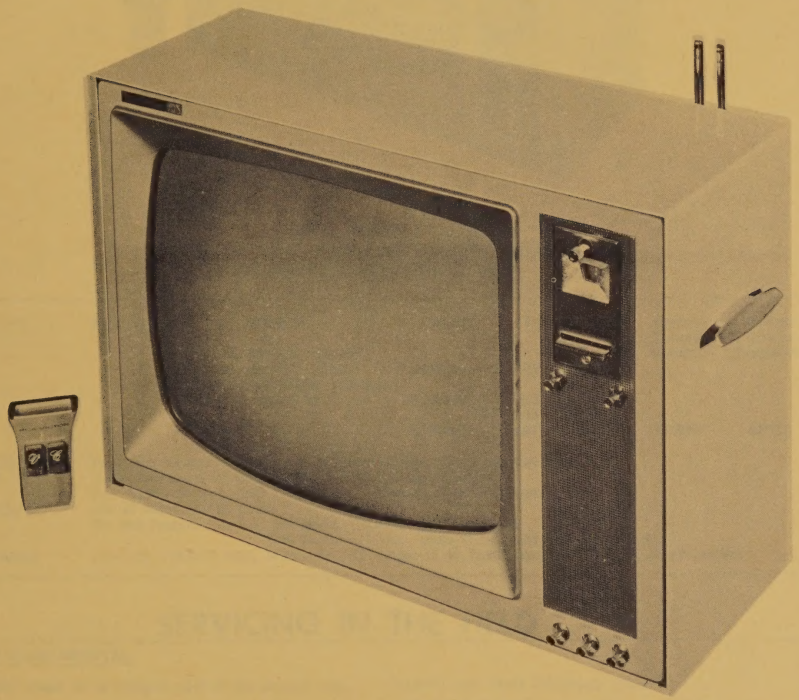
RCA VICTOR CHASSIS KCS134A, KCS134B, KCS134C, KRS24C, KRT1B

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

RCA VICTOR CHASSIS KCS134A, KCS134B, KCS134C, KRS24C, KRT1B



RCA VICTOR CHASSIS KCS134A, KCS134B, KCS134C, KRS24C, KRT1B

MODEL 191BR254
(TV CHASSIS KCS134C, REMOTE CONTROL RECEIVER KRS24C,
REMOTE CONTROL TRANSMITTER KRT1B)

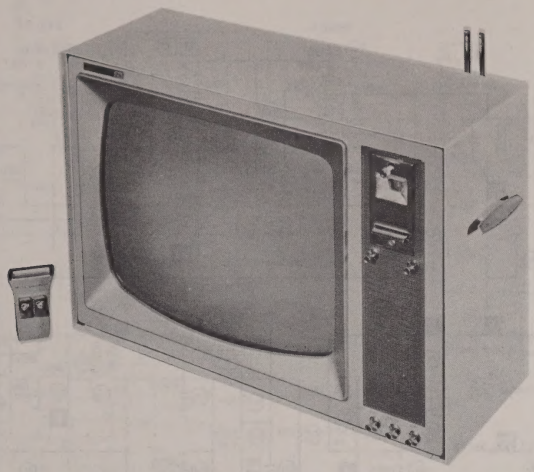
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

SET 526 FOLDER 1

RCA VICTOR CHASSIS KCS134A, KCS134B, KCS134C, KRS24C, KRT1B

RCA VICTOR CHASSIS KCS134A, KCS134B, KCS134C, KRS24C, KRT1B



MODEL 191BR254
(TV CHASSIS KCS134C, REMOTE CONTROL RECEIVER KRS24C,
REMOTE CONTROL TRANSMITTER KRT1B)

TRADE NAME	RCA Victor MODELS	TV Chassis	TUNER	Remote Control Receiver	Remote Control Transmitter
	191B242, 191B244, 191B255, 191B256, 191B257, 191S256	KCS134A	VHF - KRK96P		
	191B242U, 191B244U, 191B255U, 191B256U, 191B257U	KCS134B	VHF - KRK97P UHF - KRK66AE		
	191BR254	KCS134C	VHF - KRK87AC	KRS24C	KRT1B

MANUFACTURER	Radio Corporation of America, RCA Victor Tele. Div., Camden 8, N. J.
TYPE SET	Television Receiver (Model 191BR254 with Remote Control)
TUBES	TV: VHF - Sixteen, UHF - Seventeen Remote Control Receiver: Four
POWER SUPPLY	110-120 Volts AC, 60 Cycle
RATING	TV with Remote Control: 160 Watts, 1.5 Amp. @ 117 Volts AC (180 Watts, 1.7 Amp. while Tuning with Remote Control)
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

The safety glass is an integral part of the picture tube.

FUSE DEVICE

A fusible resistor is used for Horiz. - Vert. Sweep protection. (For location, see R74 in photo "TV Chassis - Rear View").

Two fuse wires are used for filament protection. (For location, see M3 and M4 in photo "TV Chassis - Front View").

TUNER OSCILLATOR ADJUSTMENT

To touch up the VHF Oscillator, remove channel indicator panel.

AGC

The AGC may be varied by means of an AGC Control. (For location, see "Tube Placement Chart").

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Stabilizing Coil Slug (B1). (For location, see "Tube Placement Chart").

WIDTH

The width may be varied by a Width Coil. (For location, see "Tube Placement Chart").

CENTERING

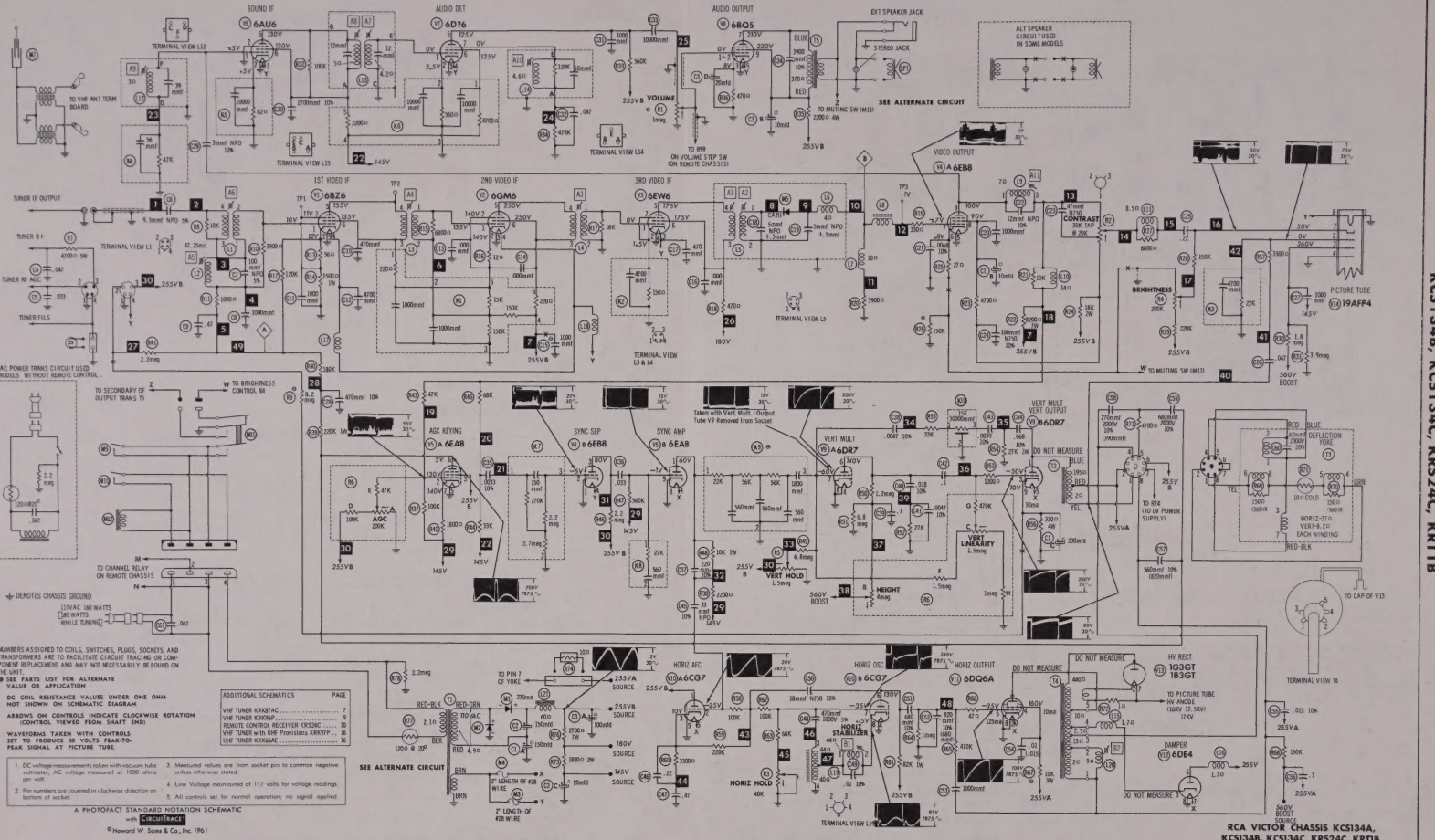
Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KA545

SET 526 FOLDER 1



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

◉ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.

ADDITIONAL SCHEMATICS	PAGE
VHF TUNER KRK82AC	7
VHF TUNER KRK96P	9
REMOTE CONTROL RECEIVER KRS3RC	10
VHF TUNER with UHF Provisions KRK97P	16
UHF TUNER KRK66AE	16

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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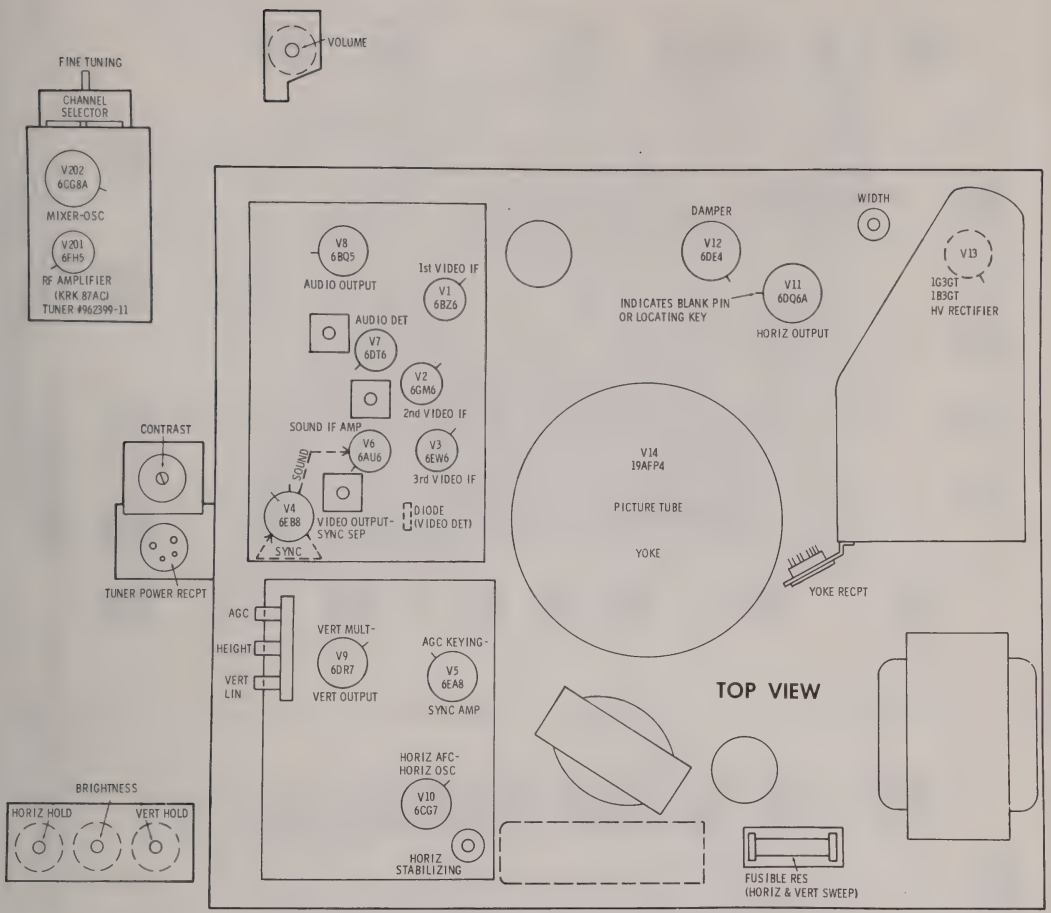
RCA VICTOR CHASSIS KCS134A, KCS134B, KCS134C, KRS24C, KRT1B

FOLDER 1

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

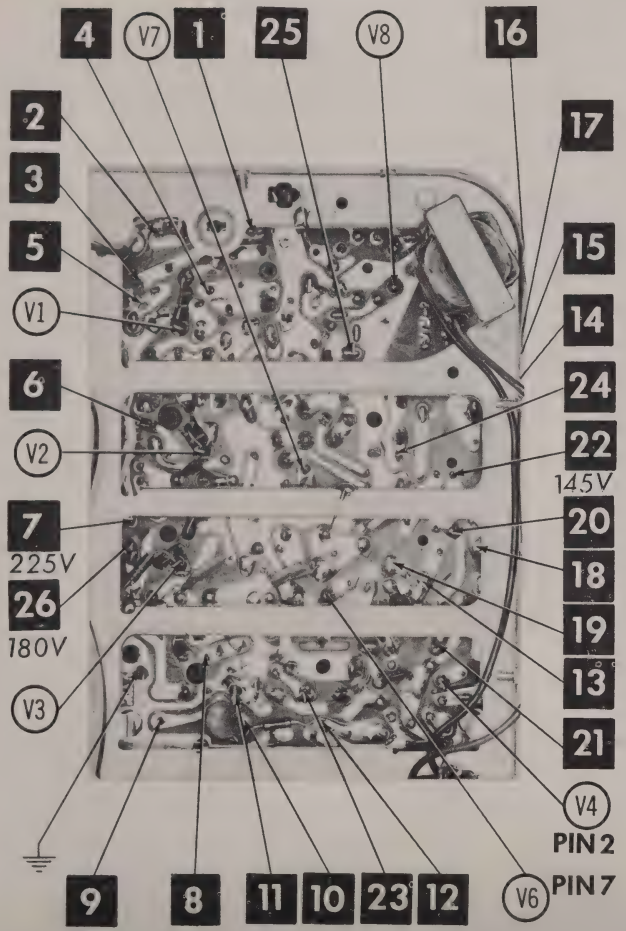
The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse Wires (Fil.), Rectifiers (B+)

SWEEP FAILURE
No raster, has sound Fuse (Horiz.-Vert. Sweep), V10, V11, V12, V13, V14
No vertical deflection V9
Poor vert. linearity or foldover V9
Poor horiz. linearity or foldover V10, V11, V12
Narrow picture V10, V11, V12, Rectifier (B+)
Vert. off freq. V9
Horiz. off freq. V10

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V14
Has pic, no sound V6, V7, V8
Overloaded picture V5

SYNC FAILURE
No vert. sync V4, V5
No horiz. sync V4, V5
No vert. or horiz. sync V4, V5



A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

MAIN PRINTED BOARD

A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

SWEEP PRINTED BOARD

TV ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Suggested Alignment Tools: A1 thru A5, A7, A8, A9, A11 ... GENERAL CEMENT #8282, 8606, 8606L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A6 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A10 ..... GENERAL CEMENT #8721, 8722
WALSCO #2519

VIDEO ALIGNMENT

Connect clip lead from point (A) to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	1500mmf Ceramic Capacitor	High side to Mixer Grid Wafer Contact thru access hole (adjacent to Mixer Grid Wafer) located in left side of tuner shield on KRK96 and 97 Tuners; to point (U) on Tuner KRK87. Low side to chassis.	44.5MC (Unmod.)	Any non-interfering channel	DC probe to point (B). Common to chassis. (Across Video Det. Load).	A1, A2	Adjust for maximum deflection. Adjust generator output to 3 volts on meter when finally peaked.
2.	"	"	45.5MC	"	"	A3	"
3.	"	"	43.0MC	"	"	A4	"
4.	"	"	47.25MC	" "	"	A5	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the negative lead of a 3.5 volt bias supply to point (A). Positive to chassis.
Connect 180Ω resistor from pin 5 (plate) to pin 6 (screen) of the 1st Video IF Amp.
Couple signal generator loosely to sweep output cable to provide markers.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	1500mmf Ceramic Capacitor	High side to Mixer Grid Wafer Contact thru access hole (adjacent to Mixer Grid Wafer) located in left side of tuner shield on KRK96 and 97 Tuners; to point (U) on Tuner KRK87. Low side to chassis.	45.0MC (10MC Swp.)	42.5MC 45.75MC	4	Vert. Amp. thru demodulator probe to pin 5 (plate) of 1st Video IF Amp. Low side to chassis. Calibrate scope for 0.5 volts peak to peak	A6 and Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
6.	"	"	"	42.5MC 45.0MC 45.75MC	"	Vert. Amp. thru 10K to point (B). Low chassis. (Across Video Det. Load). Calibrate scope for 5 volts peak to peak.	A1, A2, A3	Check for response similar to Fig. 2. If necessary, retouch A1, A3, and A4.
7.	Fig. 3	High side thru pad (Fig. 3) to Mixer Grid Wafer Contact thru access hole (adjacent to Mixer Grid Wafer) located in left side of tuner shield on KRK96 and 97 Tuners; to point (U) on Tuner KRK87. Low side to chassis.	Not Used	45.75MC	"	Use VTVM DC probe to point (B) Common to chassis.		Adjust generator output to provide exactly 1.5 volts on VTVM.
8.	1500mmf Ceramic Capacitor	Remove pad. High side to Mixer Grid Wafer Contact thru access hole (adjacent to Mixer Grid Wafer) located in left side of tuner shield on KRK96 and 97 Tuners; to point (U) on Tuner KRK87.	45.0MC (10MC Swp.)	41.25MC	"	Leave VTVM connected. Connect scope as in Step 6.	A1, A3	Retouch A1 and A4 for 1.0 to 1.5 volts on VTVM while maintaining response similar to Fig. 2.
9.	Fig. 4	Across antenna terminals thru matching network (Fig. 4).	Each VHF Channel in turn	42.5MC 45.75MC 47.25MC	All VHF Channels	Vert. Amp. thru 10K to point (B). Low side to chassis.	A1, A2	Check for response similar to Fig. 2. Retouch A1 and A3 SLIGHTLY to correct for tilt or other conditions that are approximately the same on all channels.

SOUND IF ALIGNMENT

Connect the negative lead of a 10 volt bias supply to point (A). Positive to chassis.
Set Contrast fully clockwise.
Set VTVM for negative voltage readings.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.001mfd	High side to point (B). Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	DC probe thru diode probe (Fig. 5) to pin 7 (grid 3) of Audio Detector. Common to chassis.	A7, A8, A9	Adjust for maximum negative voltage on meter. Attenuate generator for a reading between 1.0 and 1.5 volts on meter when finally peaked. Peak A7 and A8 with maximum core separation. Adjust A9 for maximum deflection.

11. Remove VTVM and diode probe. Connect scope across Volume Control. Turn off signal generator and tune in the strongest TV station in the area and adjust Volume Control for normal volume. Preset coil slug (A10) flush with the top of coil form. While observing scope and listening to the sound, adjust A10 clockwise to a peak. Continue turning clockwise to a second louder peak and adjust for maximum on this second peak.

CONTINUED ON PAGE 6

ALIGNMENT INSTRUCTIONS (cont)
TV

4.5MC TRAP ALIGNMENT

Set Contrast fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	.01mfd	High side to point (B). Low side to chassis.	4.5MC (400∿ 30% AM)	Any non-interfering channel	Vert. Amp. thru demodulator probe to pin 7 (cathode) of picture tube. Low side to chassis.	All	Adjust for MINIMUM 400∿ indication on scope.

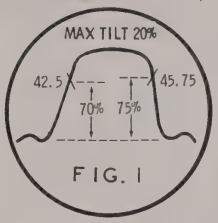


FIG. 1

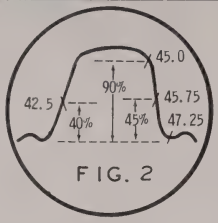


FIG. 2

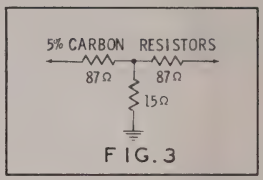


FIG. 3

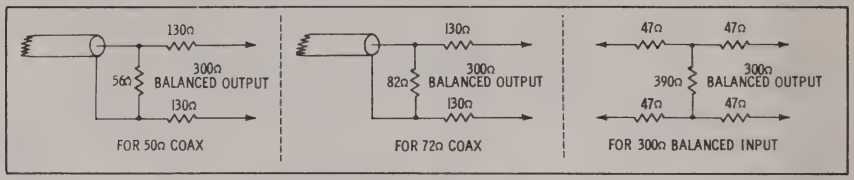


FIG. 4

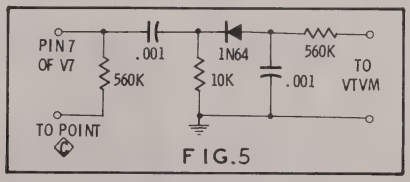
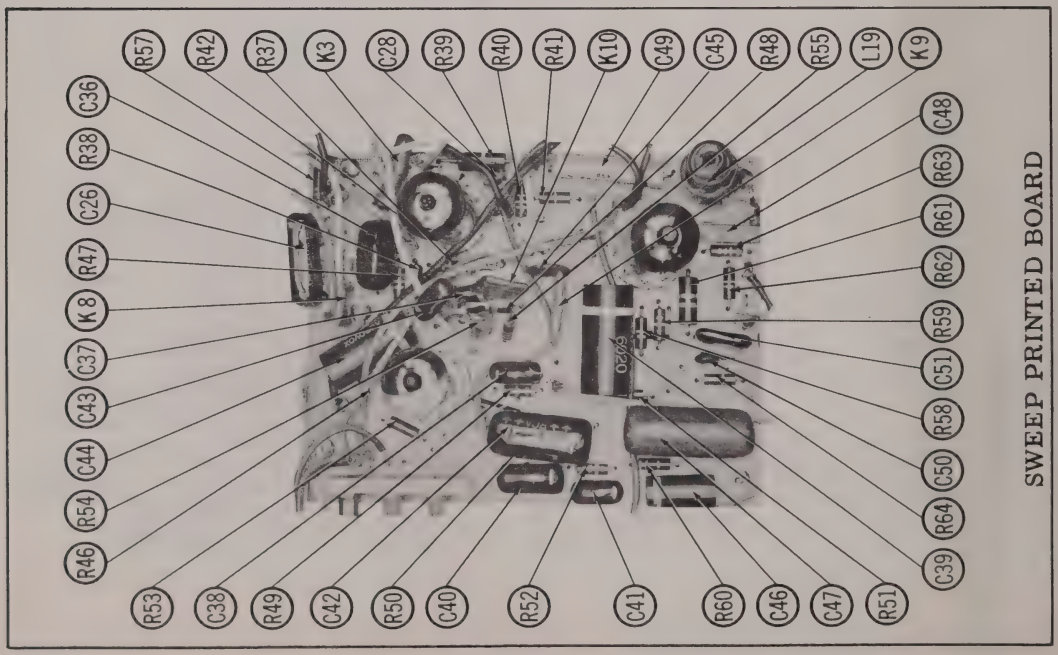
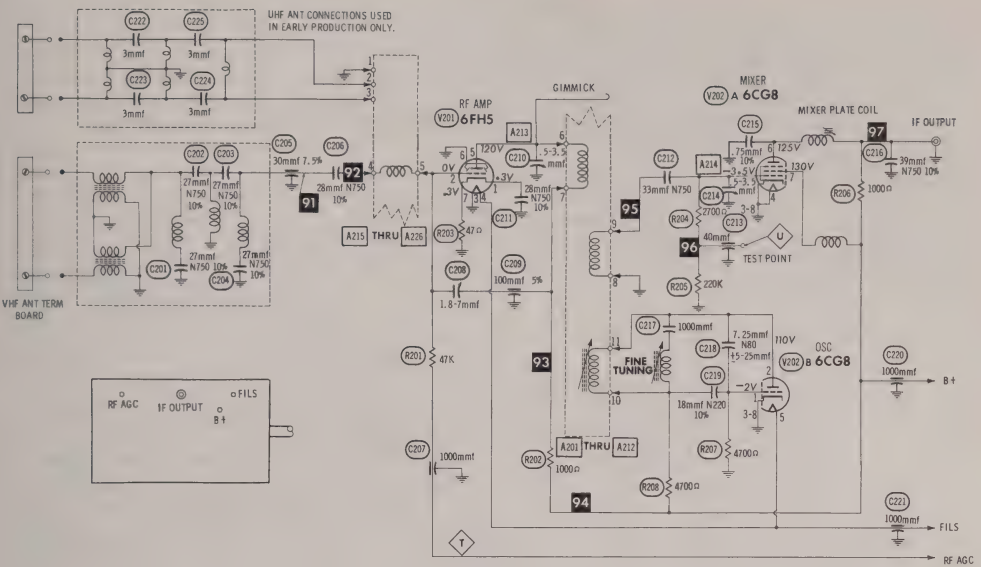


FIG. 5





A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE

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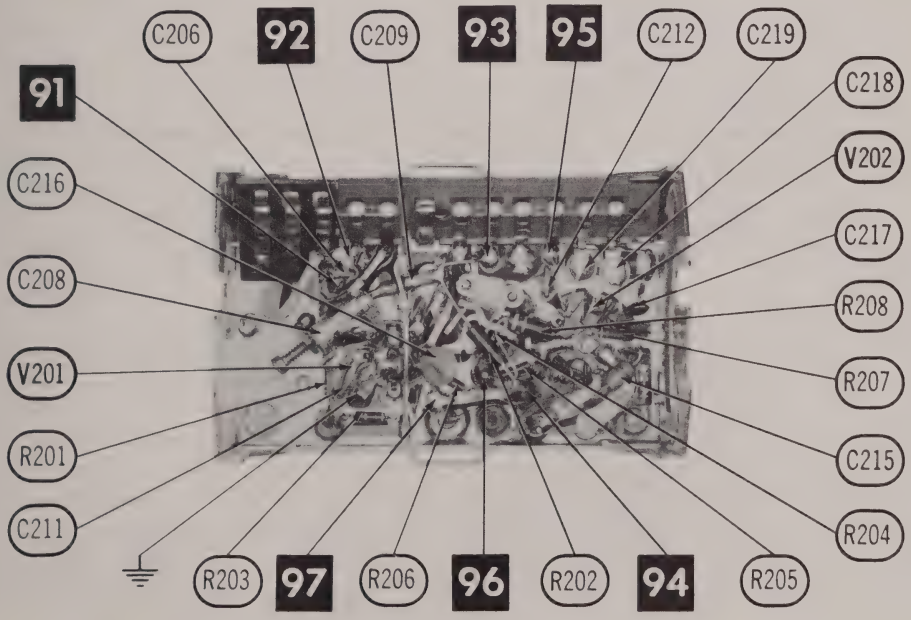
VHF TUNER KRK87AC



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ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

VHF TUNER KRK87AC - BOTTOM VIEW

TUNER ALIGNMENT INSTRUCTIONS

KRK96P, 97P

PRE-ALIGNMENT INSTRUCTIONS FOR TUNERS #KRK96 and KRK97

Allow a 20 minute warm-up period for the receiver and test equipment.

VHF RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.
Connect the negative lead of a 2.5volt bias supply to point (T). Positive to chassis.

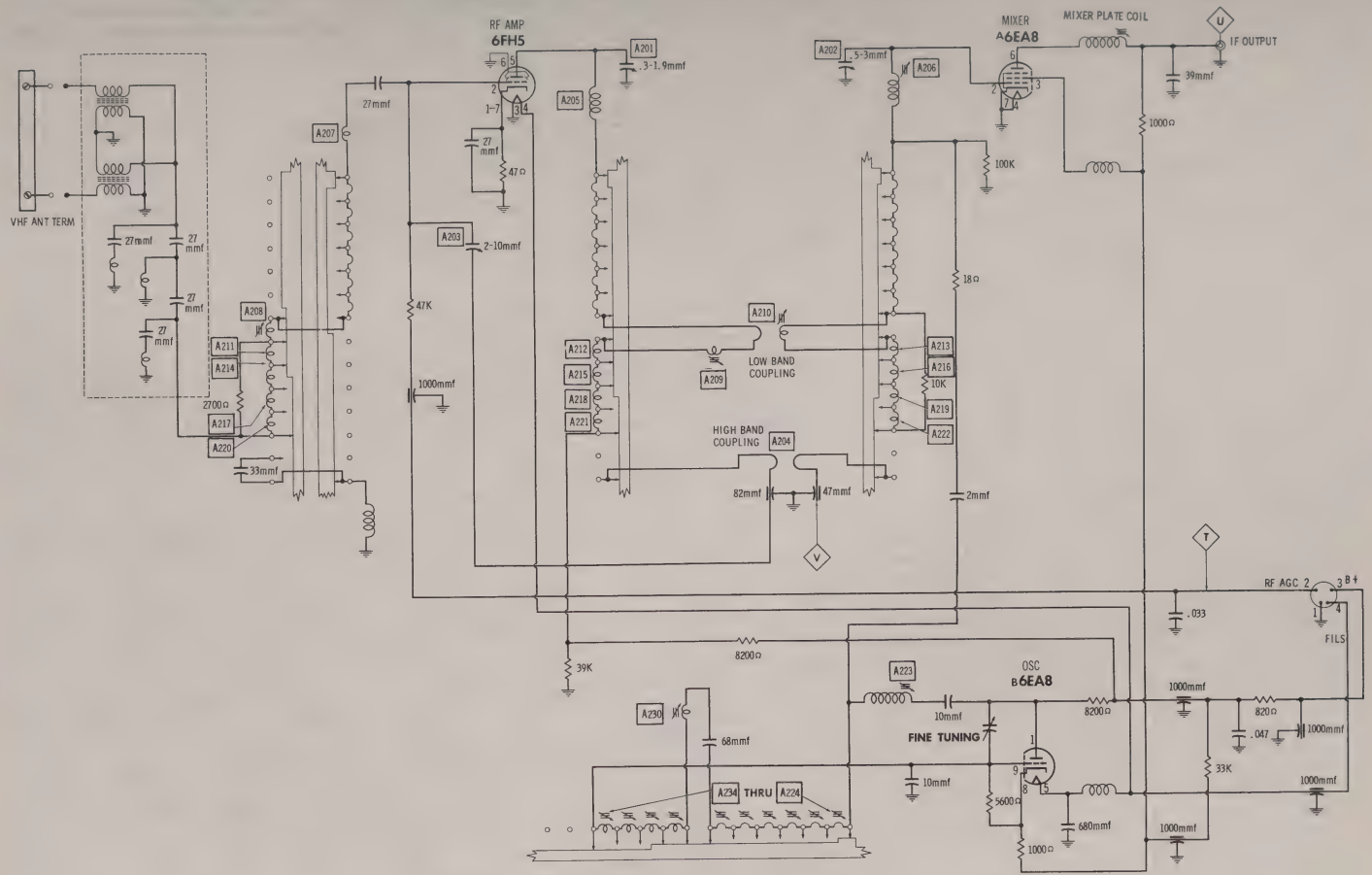
	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Across VHF Antenna Terminals thru pad (Fig. 201).	183MC	181.25MC 185.75MC	8	Vert. Amp. to point (U). Low side to chassis.	A201, A202	Adjust for maximum gain and symmetry of response similar to Fig. 202 with markers as shown. If oscillation is obtained and distorts the waveform, adjust A203 for MINIMUM gain and repeat adjustment of A201 and A202.
2.	"	195MC		10	"	A203	Increase bias to -10 to 15 volts. Adjust A203 for MINIMUM response.
3.	"	183MC	181.25MC 185.75MC	8	"	A201, A202, A204	Adjust A201 for proper frequency, A202 for proper tilt and A204 for proper bandwidth.
4.	"	213MC	211.25MC 215.75MC	13	"	A205, A206	Adjust A205 for proper frequency and A206 for proper tilt.
5.	"	"	"	"	"	A207	Adjust for maximum gain at center of response. Repeat steps 3 and 4.
6.	Turn generator off.				Use VTVM DC probe to point (V). Common to chassis.		With generator turned off, measure Oscillator injection voltage. It should be -2 and -5 volts.
7.	Across Antenna Terminals thru pad (Fig. 201).	85MC	83.25MC 87.75MC	6	Vert. Amp. of scope to point (U). Low side to chassis.	A208, A209, A210	Adjust for maximum gain and symmetry of response similar to Fig. 202 with markers as shown. First adjustment is for amplitude, second for frequency, and third for tilt.
8.	"	79MC	77.25MC 81.75MC	5	"	A211, A212 A213	"
9	"	69MC	67.25MC 71.75MC	4	"	A214, A215 A216	"
10.	"	63MC	61.25MC 65.75MC	3	"	A217, A218 A219	"
11.	"	57MC	55.25MC 59.75MC	2	"	A220, A221 A222	"

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Connect the negative lead of a 2.5volt bias supply to point (T). Positive to chassis.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Across VHF Antenna Terminals thru pad (Fig. 201).	Not Used	257MC	13	Vert. Amp. to point (U). Low side to chassis.	A223	Adjust for zero beat.
13.	"	"	251MC	12	"	A224	"
14	"	"	245MC	11	"	A225	"
15.	"	"	239MC	10	"	A226	"
16.	"	"	233MC	9	"	A227	"
17.	"	"	227MC	8	"	A228	"
18.	"	"	221MC	7	"	A229	"
19.	"	"	129MC	6	"	A230	"
20.	"	"	123MC	5	"	A231	"
21.	"	"	113MC	4	"	A232	"
22.	"	"	107MC	3	"	A233	"
23.	"	"	101MC	2	"	A234	"

CONTINUED ON PAGE 17



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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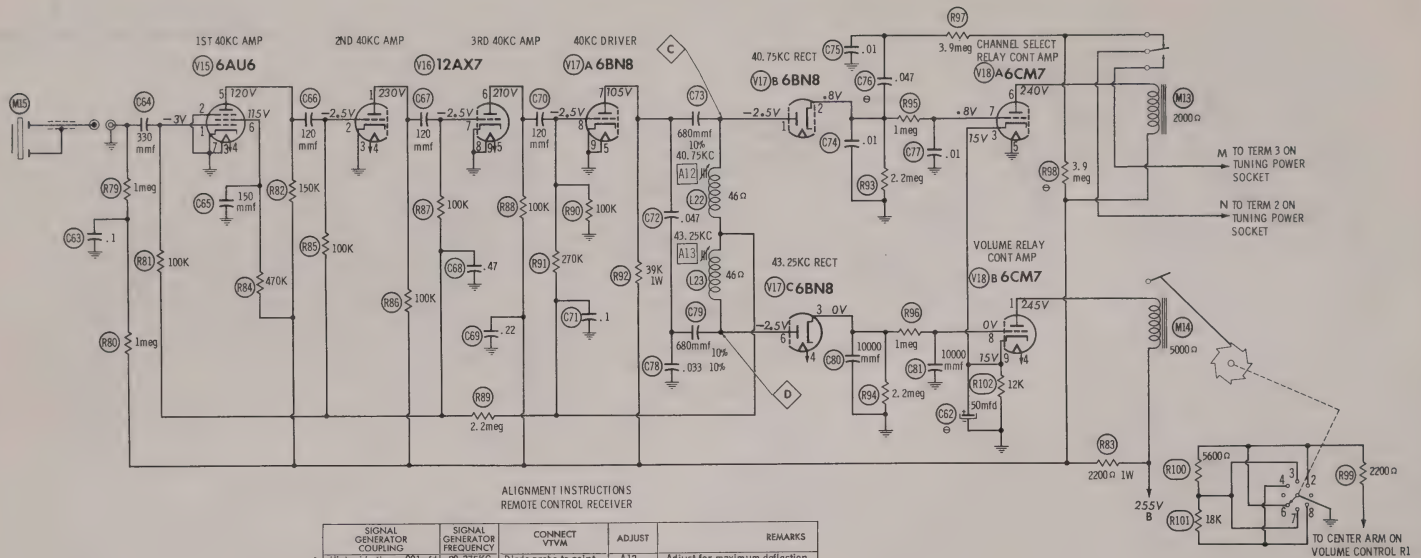
VHF TUNER KRK96P



ALIGNMENT INSTRUCTIONS
REMOTE CONTROL RECEIVER

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .001mfd to pin 1 (grid) of 1st 40KC Amp. Low side to chassis.	20.375KC	Diode probe to point ◇. Common to chassis.	A12	Adjust for maximum deflection.
2.	"	21.625KC	Diode probe to point ◇. Common to chassis.	A13	Adjust for maximum deflection.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V15	6AU6	2.7meg	0Ω	0Ω	.1Ω	†150K	†470K	0Ω		
V16	12AX7	†100K	2.7meg	0Ω	.1Ω	.1Ω	†100K	2.7meg	0Ω	0Ω
V17	6BN8	370K	2.2meg	2.2meg	.1Ω	0Ω	370K	†41K	100K	0Ω
V18	6CM7	†5000Ω	NC	12K	.1Ω	0Ω	†4200Ω	3.2meg	3.2meg	12K

† MEASURED FROM OUTPUT OF M1. NC NO CONNECTION

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REMOTE CONTROL RECEIVER KRS24C

TV PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	1st Video IF Amp.	6BZ6	V8	Audio Output	6BQ6
V2	2nd Video IF Amp.	6GM6	V9	Vert. Mult. - Vert. Output	6DR7
V3	3rd Video IF Amp.	6EW6	V10	Horiz. AFC - Horiz. Osc.	6CG7
V4	Video Output - Sync Sep.	6EB8	V11	Horiz. Output	6DQ6A
V5	AGC Keying - Sync Amp.	6EA8	V12	Damper	6DE4
V6	Sound IF Amp.	6AU6	V13	HV Rectifier	1G3GT/1B3GT
V7	Audio Detector	6DT6			

PICTURE TUBE

ITEM No.	REPLACEMENT DATA					NOTES
	RCA Victor PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
V14	19AFP4		19AFP4 ①		19AFP4 ②	① Aluminized ② Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	▲150	200	107471	AFH3-167-20		FP333.05	TMD-2440	TVL-2643	
B	■10	350				TC59	TD-250-25	TVA-1208	
C	▲200	25							
C2	150	200	107472	AFH1-25-70		WP125.9	TD-150-200	TVLS-1539 *	
C3A	▲100	350	109173	AFH4-103-40	D0805	FP421.3	TMQ-4373	TVLS-4662.2 *	
B	■10	350							
C	▲20	350							
D	20	25							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REMARKS	REPLACEMENT DATA						
					AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	.047	600V			P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-4147	6TM-S47	
C5	.033	200V			P288N-033	DD-303	CUB6S33	4DP-2-333	GEM-4133	6TM-S33	
C6	9.5	NPO			NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10	
C7	100	NPO	5%			DTZ-100	C10T1C		CNO-310	10TCC-T10	
C8	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10	
C9	.47	200V			P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47	
C10	470				BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47	
C11	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10	
C12	4700				BPD-0047	DD-472	BYA10D47M	CCD-472	B-210	5HK-D47	
C13	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10	
C14	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10	
C15	1000			Note 1	BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10	
C16	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10	
C17	470				BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47	
C18	5	NPO	±.5mmf		NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50	
C19	5	NPO	±.5mmf		NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50	
C20	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10	
C21	.0068	400V	10%		V84C4068-10%		PM6D68	6DP-1-682	GEM-16268	6TM-D68	
C22	12	NPO	10%			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12	
C23	47	N750			N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47	
C24	100	N750	10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10	
C25	.22	600V			P688N-22		CUB6P22	6DP-5-224	GEM-6022	6TM-P22	
C26	.047	400V			P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47	
C27	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10	
C28	470		10%		BPD-00047	DD-471	5R5T47	CCD-471	GP347	10TS-T47	
C29	3	NPO	10%		NPO-SI 3.0	TCZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33	
C30	2700				DI-2700		DPMS6D27	CCD-272		10TS-D27	
C31	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10	
C32	.047	200V			P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47	
C33	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10	
C34	3900		10%		DI-4000		DPMS6D39	CCD-392	JL-239	10TS-D39	
C35	.0033	600V	10%		V84C6D33-10%		PM6D33	6DP-1-332	GEM-16233	6TM-D33	
C36	.033	400V			P488N-033	DD-303	CUB6S33	4DP-2-333	GEM-4133	4TM-S33	
C37	220		10%		1469-00022	TCZ-220	22R5T22	CM-19B-221K	CNO-322	MS-322	
C38	.0047	600V	10%		V84C6D47-10%		PM6D47	6DP-1-472	GEM-16247	6TM-D47	
C39	.1	600V			P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10	
C40	.018	600V	10%		P684CM-018		PM6S2	6DP-2-203	GEM-612	6TM-S20	
C41	.0047	600V	10%		V84C6D47-10%		PM6D47	6DP-1-472	GEM-16247	6TM-D47	
C42	.1	600V			P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10	
C43	.0039	600V	10%		P684CM-0039		DPMS6D39	6DP-1-392	GEM-1624	6PS-D39	
C44	.068	600V	10%		V84C6S68-10%		PM6S68	6DP-4-683		6TM-S68	
C45	33	NPO	10%		NPO-DI 33	DTZ-33	C10Q33C	CCTO-330	CNO-433	10TCC-Q33	
C46	.22	200V			P288N-22		CUB2P22	2DP-4-424	GEM-2022	2TM-P22	
C47	.47	200V			P288N-47		CUB2P47	2DP-5-474	GEM-4047	2TM-P47	
C48	470	1000V	5%	#105672				VCM-20-471J			
C49	.01	400V	10%		V84C4S1-10%		PM4S1	4DP-1-103	GEM-1611	4TM-S10	
C50	18	N750	10%		N750-DI 20	TCN-18	C10Q18U		CN7-418	10TCU-Q18	
C51	680		10%		1469-00068		5R5T68	CM-19B-681K	MCJ249	MS-368	
C52	820		10%	(680) †	1469-00082		5R5T82	CM-19B-821K	MCE251	MS-382	
C53	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10	
C54	.01	600V		(.015) †	P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10	

FIXED CAPACITORS (cont)

ITEM No.	RATING			REMARKS	REPLACEMENT DATA						
					AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C55	.022	600V	10%		V84C6822-10%		PME622	SDP-3-223	GEM-1813	GTM-S22	
C56	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10	
C57	560	2000V	10%	(820) †	DI-580	DD-561	5S6T56	CCD-561	GP356	10TS-T56	
C58	270	2000V	10%	(390) †				VCM-35-271K			
C59	680	2000V	10%	#106602							
C60	82	2000V	10%				HVA20Q82			2DY-482	
C61	.047	600V			P488N-047	DD-503	CUB4S47	6DP-3-473	GEM-4147	GTM-S47	

Note 1. May not be used in some versions. † Alternate Value. # RCA Victor Part Number.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1meg	½	109529 ①	AB-T0	A47-1meg-E	B13-137	U33	Volume
B	Shaft			AK-33	RS-3/16	SK9	D8-37	
R2	30K	½	109301					Contrast
	20K Tap							
R3	40K	½	109530					Horiz. Hold
R4A	200K	½	109178	AB-46	A47-200K-S	B11-129	U43	Brightness
B	Shaft			AK-33	RS-3/16	SK9	D8-37	
R5A	1.5meg	½	109177	AB-742	A47-1.5meg-S	B11-138	U155	Vert. Hold
B	Shaft			AK-33	RS-3/16	SK9	D8-37	
R6A	200K		107280					AGC
B	4meg							Height
C	1.5meg							Vert. Linearity
D	100K							Voltage Divider
E	47K							AGC Coupling
F	1.5meg							Voltage Divider
G	470K							Vert. Linearity Coupling
H	1meg							Vert. Linearity Limiter

① Chassis KCS134A, B use Volume with Switch (Part #109528).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R7	4700Ω 5W	PW5-4700	5W-SQ-4700		R43	47K			
R8	10K				R44	33K			
R9	6.2meg				R45	68K			
R10	3900Ω				R46	2.2meg			
R11	1000Ω				R47	560K			
R12	120K				R48	10K 1W			
R13	56Ω				R49	6.8meg			
R14	1500Ω 1W				R50	1.2meg			
R15	6800Ω				R51	6.8meg			
R16	12Ω				R52	27K			
R17	18K				R53	1000Ω			
R18	470Ω				R54	27K 1W			
R19	330Ω				R55	33K			
R20	3900Ω				R56	330Ω 4W	PW4-330	4W-SQ-330	#107292
R21	10K				R57	3300Ω			
R22	8200Ω 7W	PW7-8200	7W-SQ-8200	#106975	R58	100K			
R23	4700Ω				R59	220K			
R24	18K 2W				R60	3300Ω			
R25	27Ω				R61	82K 1W			
R26	150K①				R62	100K			
R27	6800Ω				R63	68K			
R28	150K				R64	1meg			
R29	220K				R65	470K			
R30	1.5meg				R66	47Ω			
R31	3.9meg				R67	10K 5W②	PW5-10K	3G-10K	#213756
R32	100K				R68	150K			
R33	560K				R69	150Ω			(560Ω) *
R34	470K				R70	150Ω			(560Ω) *
R35	2200Ω 4W	PW5-2200	4W-SQ-2200	#103352	R71	10Ω (Cold)			
R36	470Ω				R72	1Ω			
R37	100K				R73	4700Ω			
R38	2200Ω				R74	10Ω †	FR 10	7F5	#104295
R39	220K 1W				R75	1800Ω 2W			
R40	180K				R76	2700Ω 7W	PW10-2700	7W-SQ-2700	#102789A #107191
R41	2.2meg				R77	120Ω (Cold)			
R42	1800Ω				R78	2.2meg			

RCA Victor Part Number. * Alternate Value.
① May not be used in some versions. † Fusible Type.
② Late prod. chassis use 8200Ω 5W (Part # 106255).

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	RCA Victor PART No.	REPLACEMENT DATA
K1	2nd Video IF Decoupling	1000mmf, 1000mmf, 220Ω, 220Ω, 15K, 150K, 150K	107277	Centralab PC-387
K2	3rd Video IF Cathode	4700mmf, 150Ω	109320	
K3	Vert. Blanking	4700mmf, 22K	107383	
K4	Sound IF Grid	56mmf, 47K	104329	Centralab RC-421 Sprague PRC-1
K5	Sound IF Cathode	10000mmf, 82Ω	107278	Centralab PC-381 Sprague PRC-18
K6	Audio Detector Cathode	10000mmf, 10000mmf, 560Ω, 4700Ω, 220Ω	107276	Centralab PC-380
K7	Sync Sep. Grid	150mmf, 270K, 2.2meg, 2.7meg	107200	Centralab PC-381
K8	Sync Sep. Plate	560mmf, 27K	107492	
K9	Vert. Integrator	560mmf, 560mmf, 560mmf, 1800mmf, 82K, 56K, 56K	109536 ① (973929-7)	
K10	Vert. Feedback	30000mmf, 15K	109537	

① Later production chassis may use Part #109583 (973929-8) in this application.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		RCA Victor PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	1st Video IF	107202					
L2	47.25MC Trap	107203					
L3	2nd Video IF	109071					
L4	3rd Video IF	109158					
L5	4th Video IF	109076					
L6	Peaking (36uh)	101849	TV-180	6176	RTC-8593	T307	
L7	Peaking (220uh)	101287	TV-186	6181	RTC-8596	T315	
L8	RF Choke (5.6uh)	109171	BC-565	4609	RTC-8519	T959	
L9	4.5MC Trap	104903					
L10	Peaking (5.6uh)	105516	TV-304	6174	RTC-8593	T324	
L11	Peaking (300uh)	104330	TV-199	6185	RTC-8587	T318	
L12	1st Sound IF	104136					
L13	2nd Sound IF	107201					
L14	Quadrature	105795					
L15	RF Choke (8.2uh)	107285	BC-566	4611	RTC-8521	T960	
L16	RF Choke (8.2uh)	107385	BC-566	4611	RTC-8521	T960	
L17	Fil. Choke (1uh)	73477	BC-561	4602	RTC-8515	T855	
L18	Fil. Choke (1uh)	73477	BC-561	4602	RTC-8515	T855	

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		RCA Victor PART No.	Merit PART No.	Miller PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	Workman TV PART No.	
L19A	Horiz. Osc.	107284								
B	Horiz. Stabilizer									
L20	Width Coil (1.5MH – 12MH)	105522	MWC-6	6322	QRC109	WC-8	WC-22	WLC-6	T107	

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (@ CURRENT 1000 ~)	RCA Victor PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L21	.270A	60Ω	.9 Hy.	100286	C-2996 ①	C-2343	26C44 ①	C-34X	① Drill new mounting hole(s).

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	RCA Victor PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V ② 1.7A	110V ② .850A AC	6.3V ② 11.5A	109089					

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		RCA Victor PART No.	Merit PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	Vert. Output	109066			VO-101	26S14	A-140X	
T3	Yoke (Horiz. 18MH) (Vert. 15MH) Rear Cover and Centering Device	109532		PCM-2017①	DY-26A ②	Y-47 ②	Y-80 & YW12	
T4	Horiz. Output	109068		HVD-116 ③		SO-289 ③	FLY-150 ③	D-200

① Remove Horizontal Damping Network and use original.
② Use original Horizontal Damping Network if necessary.
③ Drill new mounting hole(s).

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	RCA Victor PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T5	7900Ω	3-4Ω	109067	A-3020	A-3856	26S48	S-18Z	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	RCA Victor PART No.	QUAM PART No.	
SP1	4" x 6"	PM	3-4Ω	107476	46A1	

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	RCA Victor PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.270A	1N1763	1N1763	40H	SR500	
M2	.270A	1N1763	1N1763	40H	SR500	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			RCA Victor PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	2" length	#28 wire						
M4	2" length	#28 wire						

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		RCA Victor PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M5		76675B		1N60	1N60	Video Detector

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M6	Tuner	KRK87AC	VHF, Model 191B254
	Tuner	KRK96P	VHF, Model 191B256, 191B242, 4, 191B255, 6, 7
	Tuner	KRK97P	VHF with UHF Provisions, Models 191B242U, 4U, 191B255U, 6U, 7U
	Tuner	KRK86AE	UHF, Models 191B242U, 4U, 191B255U, 6U, 7U
M7	Antenna	108839	JFD REPLACEMENT #TA398, All Models except 191B256
	Antenna		JFD REPLACEMENT #TA359, Model 191B256
M8	Magnet	107192	Centering
	Printed Board	109538	Picture & Sound IF, Less Tubes, Chassis KCS134A, B
	Printed Board	109539	Picture & Sound IF, Less Tubes, Chassis KCS134C
	Printed Board	109536	Deflection Circuit, Less Tubes
M9	Switch		Channel Selector (Touch Bar), Power Tuning Assembly
M10	Switch		Pneumatic Master Off-On, Power Tuning Assembly
M11	Switch		Station Stopper & Mate, Power Tuning Assembly
M12	Motor		Power Tuning Drive, Power Tuning Assembly

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 6230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8486 (Round) - 8 Conductor

REMOTE CONTROL RECEIVER PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆ TYPE
V15	1st 40KC Amp.	6AU8
V16	2nd - 3rd 40KC Amp.	12AX7
V17	40KC Driver - 40.75KC Rect. - 43.25KC Rect.	6BN8
V18	Channel Sel. Relay Control Amp. - Volume Relay Control Amp.	6CM7

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C82	50	25	94667	PRB255	BBR50-25	TC29	TD-50-25	TVA-1306	Note 1

Note 1. Later production chassis may use 100 mfd @ 25 V (Part #106020).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REMARKS	REPLACEMENT DATA						
				AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C83	.1	400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10	
C84	330			DI-330	DD-331	L10T33	CCD-331	B-333	10TS-T33	
C85	150			DI-150	DD-151	L10T15	CCD-151	B-315	10TS-T15	
C86	120			DI-120	DD-121	L10T12	CCD-121	GP312	10TS-T12	
C87	120			DI-120	DD-121	L10T12	CCD-121	GP312	10TS-T12	
C88	.47	200V		P288N-47		CUB2P47	2DP-5-474	GEM-3047	2TM-P47	
C89	.22	400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22	
C90	120			DI-120	DD-121	L10T12	CCD-121	GP312	10TS-T12	
C91	.1	200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10	
C92	.047	400V		P488N-047	DD-503	CUB4S47	6DP-3-473	GEM-4147	4TM-S47	
C93	680		10%	1469-00068		5S6T68	CM-19B-681K	MC1249	MS-368	
C94	.01	400V		P488N-01	DS-103	CUB4S	4DP-1-103	GEM-411	4TM-S10	
C95	.01	400V		P488N-01	DS-103	CUB4S	4DP-1-103	GEM-411	4TM-S10	
C96	.047	400V	Note 1	P488N-047	DD-503	CUB4S47	6DP-3-473	GEM-4147	4TM-S47	
C97	.01	400V		P488N-01	DS-103	CUB4S	4DP-1-103	GEM-411	4TM-S10	
C98	.033	200V	10%	V84C2833-10%		PME833	4DP-2-333	GEM-1613	6TM-S33	
C99	680		10%	1469-00068		5S6T68	CM-19B-681K	MC1249	MS-368	
C80	10000			BPD-01	DD-103	BYA10S	CCD-103	B-110	5HK-S10	
C81	10000			BPD-01	DD-103	BYA10S	CCD-103	B-110	5HK-S10	

Note 1. Later production chassis may use .015 mfd @ 400V in this application.

RCA VICTOR CHASSIS KCS134A, KCS134B, KCS134C, KRS24C, KRT1B

FOLDER 1

REMOTE CONTROL RECEIVER
PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R79	1meg			
R80	1meg			
R81	100K			
R82	150K			
R83	2200Ω 1W			
R84	470K			
R85	100K			
R86	100K			
R87	100K			
R88	100K			
R89	2.2meg			
R90	100K			

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R91	270K			
R92	39K 1W			
R93	2.2meg			
R94	2.2meg			
R95	1meg			
R96	1meg			
R97	3.9meg			
R98	3.9meg			Note 1
R99	2200Ω			
R100	5600Ω			
R101	18K			
R102	12K			

Note 1. Later production chassis may use 10 meg in this application.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		RCA Victor PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L22	40.75KC	107539					
L23	43.25KC	107539					

MISCELLANEOUS

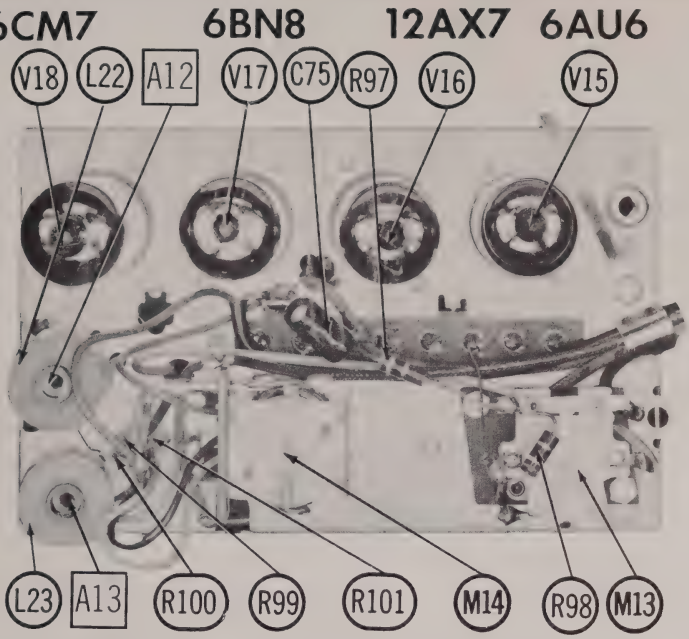
ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M13	Relay	107405	Channel Selector
M14	Relay	109124	Volume Control
M15	Microphone	107850	

CABINETS & CABINET PARTS

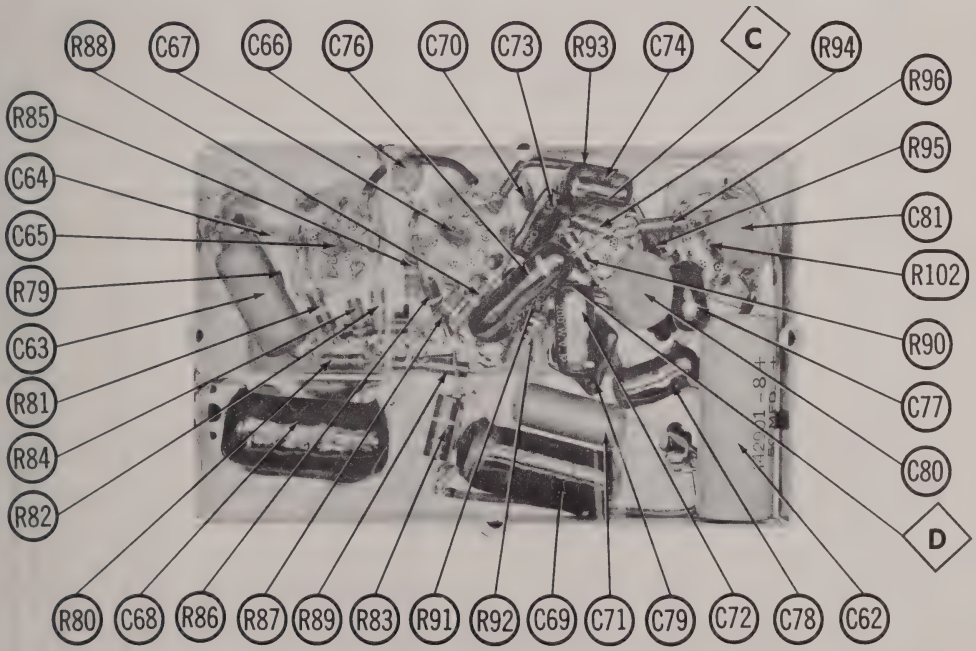
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

DESCRIPTION	PART NO.	MODEL 191B242, U	191B244, U	191B255, U	191B256, U	191B257, U	191BR254	191S256
Mask	109522	X						
Mask	109523		X					
Mask	109525						X	
Mask	109524			X	X	X		X
Dial- UHF Channel Selector (UHF Models)	109131			X	X	X		
Dial- "	107266	X	X					
Knob-VHF Channel Selector	109501	X	X					
Knob- "	109502			X	X	X		X
Knob- UHF Channel Selector (UHF Models)	107269	X	X					
Knob- "	109128			X	X	X		
Knob-Fine Tuning	107263	X	X					
Knob- "	109130			X	X	X	X	X
Knob- " (Pre-set)	109518						X	
Knob-Volume, Contrast	107264	X	X					

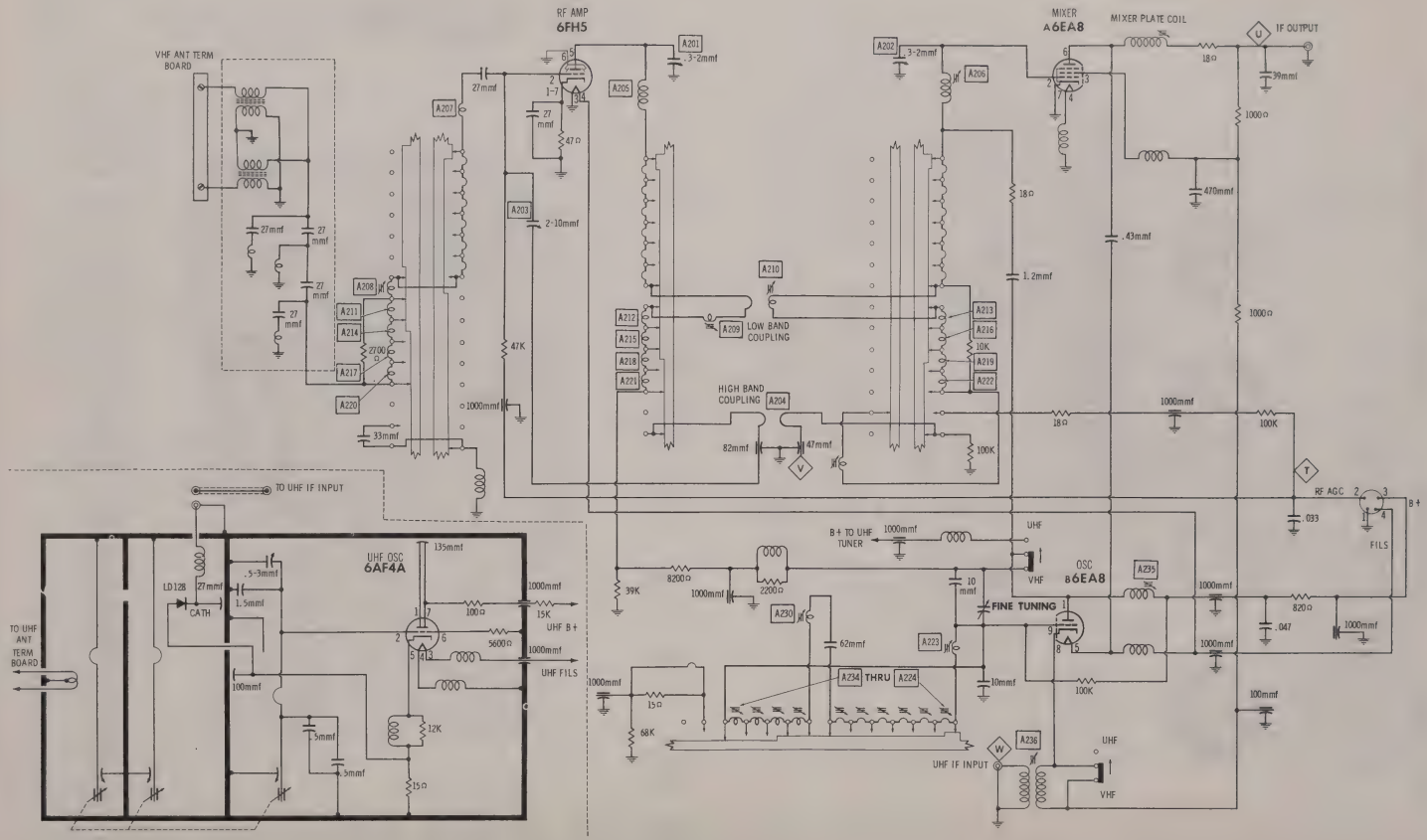
DESCRIPTION	PART NO.	MODEL 191B242, U	191B244, U	191B255, U	191B256, U	191B257, U	191BR254	191S256
Knob-Volume, Contrast	109130			X	X	X	X	X
Knob- V. Hold, H. Hold, Brightness	107265	X	X					
Knob- "	109130			X	X	X	X	X
Pushbutton- Chan. Sel. Rem. (Transmitter)	109120						X	
Pushbutton- Remote Volume (Transmitter)	109121						X	
Cabinet-Transmitter(Bottom)	109125						X	
Cabinet-Transmitter(Top)	109112						X	
Cabinet-TV	Z4806			X				
Cabinet-TV	Z4807				X			X
Cabinet-TV	Z4808					X		
Cabinet-TV	Z4804	X						
Cabinet-TV	Z4805		X					
Cabinet-TV	Z4809						X	



REMOTE CONTROL RECEIVER - TOP VIEW



REMOTE CONTROL RECEIVER - BOTTOM VIEW



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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UHF TUNER KRK66AE

VHF TUNER with UHF Provisions KRK97P

TUNER ALIGNMENT INSTRUCTIONS (cont)

KRK96P, 97P

UHF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.
Connect the negative lead of a 2.5volt bias supply to point Ⓣ. Positive to chassis.
Connect a 180Ω resistor across input cable of scope.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
24.	High side thru input head (Fig. 203) to point Ⓦ Low side to chassis.	45MC (10MC Swp.)	41.25MC 45.75MC	UHF Any	Vert. Amp. thru 330mmf to plate of Mixer. Low side to chassis.	A235, A236	Adjust for maximum gain and symmetry of response similar to Fig. 204 with markers as shown.
25.	Across UHF Antenna Terminals.	To center frequency of channel to be received. (See Chart #1)	"	Channel to be Received	Scope across Video Det. Load	A235, A236	Retouch for response similar to Fig. 205.

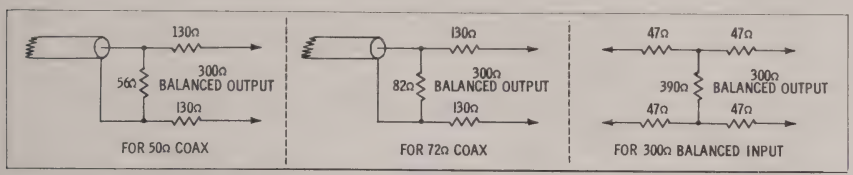


FIG. 201

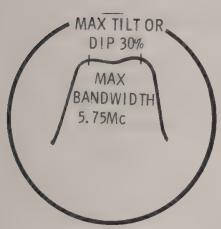


FIG. 202

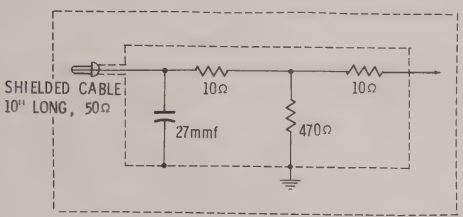


FIG. 203

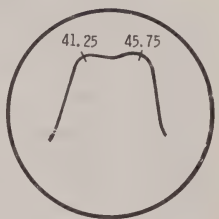


FIG. 204

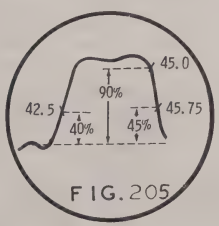


FIG. 205

CHART NO. 1

Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier	Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier	Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier	Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier
2	54-60	55.25	59.75	23	524-530	525.25	529.75	44	650-656	651.25	655.75	64	770-776	771.25	775.75
3	60-66	61.25	65.75	24	530-536	531.25	535.75	45	656-662	657.25	661.75	65	776-782	777.25	781.75
4	66-72	67.25	71.75	25	536-542	537.25	541.75	46	662-668	663.25	667.75	66	782-788	783.25	787.75
5	76-82	77.25	81.75	26	542-548	543.25	547.75	47	668-674	669.25	673.75	67	788-794	789.25	793.75
6	82-88	83.25	87.75	27	548-554	549.25	553.75	48	674-680	675.25	679.75	68	794-800	795.25	799.75
7	174-180	175.25	179.75	28	554-560	555.25	559.75	49	680-686	681.25	685.75	69	800-806	801.25	805.75
8	180-186	181.25	185.75	29	560-566	561.25	565.75	50	686-692	687.25	691.75	70	806-812	807.25	811.75
9	186-192	187.25	191.75	30	566-572	567.25	571.75	51	692-698	693.25	697.75	71	812-818	813.25	817.75
10	192-198	193.25	197.75	31	572-578	573.25	577.75	52	698-704	699.25	703.75	72	818-824	819.25	823.75
11	198-204	199.25	203.75	32	578-584	579.25	583.75	53	704-710	705.25	709.75	73	824-830	825.25	829.75
12	204-210	205.25	209.75	33	584-590	585.25	589.75	54	710-716	711.25	715.75	74	830-836	831.25	835.75
13	210-216	211.25	215.75	34	590-596	591.25	595.75	55	716-722	717.25	721.75	75	836-842	837.25	841.75
14	470-476	471.25	475.75	35	596-602	597.25	601.75	56	722-728	723.25	727.75	76	842-848	843.25	847.75
15	476-482	477.25	481.75	36	602-608	603.25	607.75	57	728-734	729.25	733.75	77	848-854	849.25	853.75
16	482-488	483.25	487.75	37	608-614	609.25	613.75	58	734-740	735.25	739.75	78	854-860	855.25	859.75
17	488-494	489.25	493.75	38	614-620	615.25	619.75	59	740-746	741.25	745.75	79	860-866	861.25	865.75
18	494-500	495.25	499.75	39	620-626	621.25	625.75	60	746-752	747.25	751.75	80	866-872	867.25	871.75
19	500-506	501.25	505.75	40	626-632	627.25	631.75	61	752-758	753.25	757.75	81	872-878	873.25	877.75
20	506-512	507.25	511.75	41	632-638	633.25	637.75	62	758-764	759.25	763.75	82	878-884	879.25	883.75
21	512-518	513.25	517.75	42	638-644	639.25	643.75	63	764-770	765.25	769.75	83	884-890	885.25	889.75
22	518-524	519.25	523.75	43	644-650	645.25	649.75								

VHF TUNER PARTS LIST AND DESCRIPTIONS

KRK87AC

TUBES

• GENERAL ELECTRIC •			• RAYTHEON •			• SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amplifier	6FH5	V202	Mixer - Osc.	6CG8A			

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

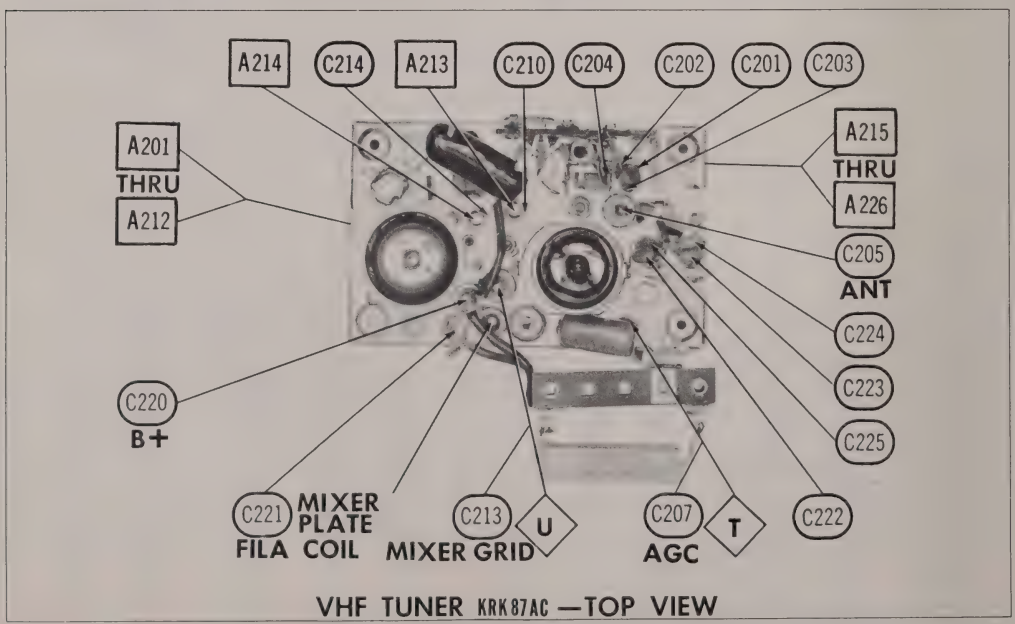
ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C202	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C203	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C204	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C205	30 7.5%	#107876						
C206	28 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C207	1000		EF-001	MFT-1000		CCF-102	CT280A	
C208	1.8-7	#107886		-				
C209	100 5%		EF-0001	MFT-100				
C210	.5-3.5	#109218		829-3				
C211	28 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C212	33 N750		N750-DI 33	DTN-33	C10Q33U	CCTN-330	CN7-433	10TCU-Q33
C213	40	#107881						
C214	.5-3.5	#109218						
C215	.75 10%	#109425						
C216	39 N750 5%		N750-DI 39	TCN-39	C10Q39U	CCTN-390	CN7-439	10TCU-Q39
C217	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C218	7.25 N80 +5-25mmf	#109424						
C219	18 N220 10%	#107884				*		10TCR-Q18
C220	1000		EF-001	MFT-1000		CCF-102	CT280A	
C221	1000		EF-001	MFT-1000		CCF-102	CT280A	
C222	3		NPO-DI 3.0	DTZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33
C223	3		NPO-DI 3.0	DTZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33
C224	3		NPO-DI 3.0	DTZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33
C225	3		NPO-DI 3.0	DTZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33

RCA Victor Part Number * Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R201	47K				R205	220K			
R202	1000Ω				R206	1000Ω			
R203	47Ω				R207	4700Ω			
R204	2700Ω				R208	4700Ω			



VHF TUNER KRK87AC —TOP VIEW

TUNER ALIGNMENT INSTRUCTIONS

KRK87AC

PRE-ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools: A201 thru A212 .... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A213, A214 ..... GENERAL CEMENT #8607, 9291, 9294
WALSCO #2520, 2522, 2523, 2524, 2534, 2537

VHF OSCILLATOR ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point (T). Positive to chassis.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Set Fine Tuning to the center for each channel by pushing in on the Fine Tuning knob and turning fully clockwise, then counterclockwise three (3) full turns. Repeat for each channel to be adjusted.
Connect a 39 ohm composition resistor in series with a 1000mmf capacitor across the tuner output jack.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Across VHF antenna terminals thru matching pad (See Fig. 201).	257MC	13	Vert. Amp. thru 10K to point (U). Low side to chassis.	A201	Adjust for zero beat.
	"	251MC	12	"	A202	"
	"	245MC	11	"	A203	"
	"	239MC	10	"	A204	"
	"	233MC	9	"	A205	"
	"	227MC	8	"	A206	"
	"	221MC	7	"	A207	"
	"	129MC	6	"	A208	"
	"	123MC	5	"	A209	"
	"	113MC	4	"	A210	"
	"	107MC	3	"	A211	"
	"	101MC	2	"	A212	"

VHF RF AND MIXER ALIGNMENT

Connect Bias as under "VHF Oscillator Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Leave tuner output jack terminated as under "VHF Oscillator Alignment".

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Across VHF antenna terminals thru matching pad (Fig. 201).	195MC (10MC Swp.)	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point (U). Low side to chassis.	A213, A214	Adjust for maximum gain and symmetry of response similar to Fig. 202 with markers as shown.
	"	213MC	211.25MC 215.75MC	13	"	A215	If necessary, adjust to correct for improper tilt.
	"	207MC	205.25MC 209.75MC	12		A216	Adjust by expanding or compressing coil turns.
	"	201MC	199.25MC 203.75MC	11		A217	"
	"	195MC	193.25MC 197.75MC	10		A218	"
	"	189MC	187.25MC 191.75MC	9		A219	"
	"	183MC	181.25MC 185.75MC	8		A220	"
	"	177MC	175.25MC 179.75MC	7		A221	"
	"	85MC	83.25MC 87.75MC	6		A222	"
	"	79MC	77.25MC 81.75MC	5		A223	"
	"	69MC	67.25MC 71.75MC	4		A224	"
	"	63MC	61.25MC 65.75MC	3		A225	"
	"	57MC	55.25MC 59.75MC	2		A226	"

If bandwidth is out of limits on most high VHF channels (7-13), adjust A227 by expanding or compressing coil turns.

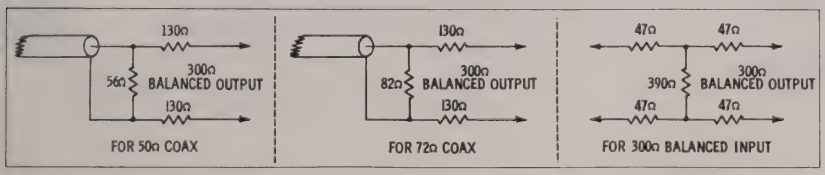
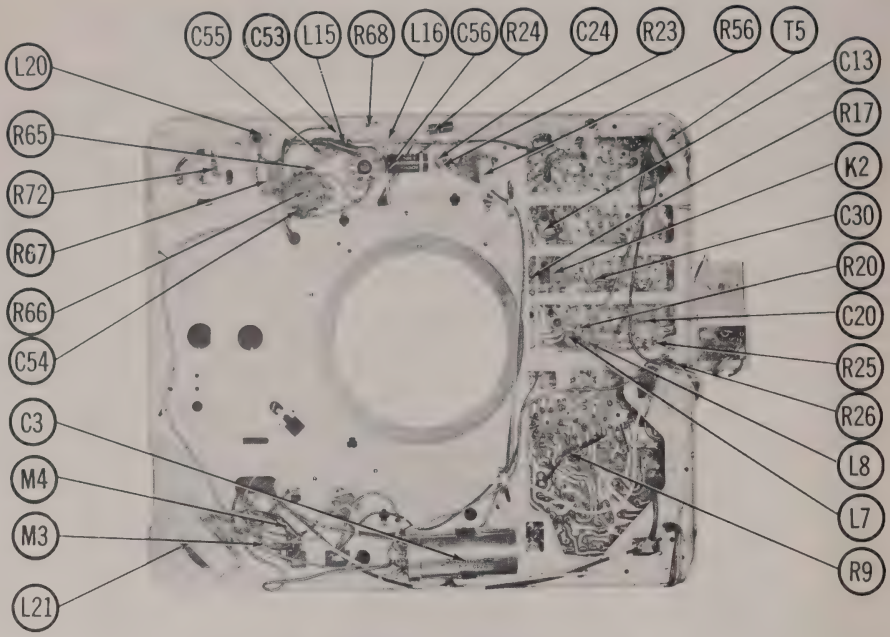


FIG. 201

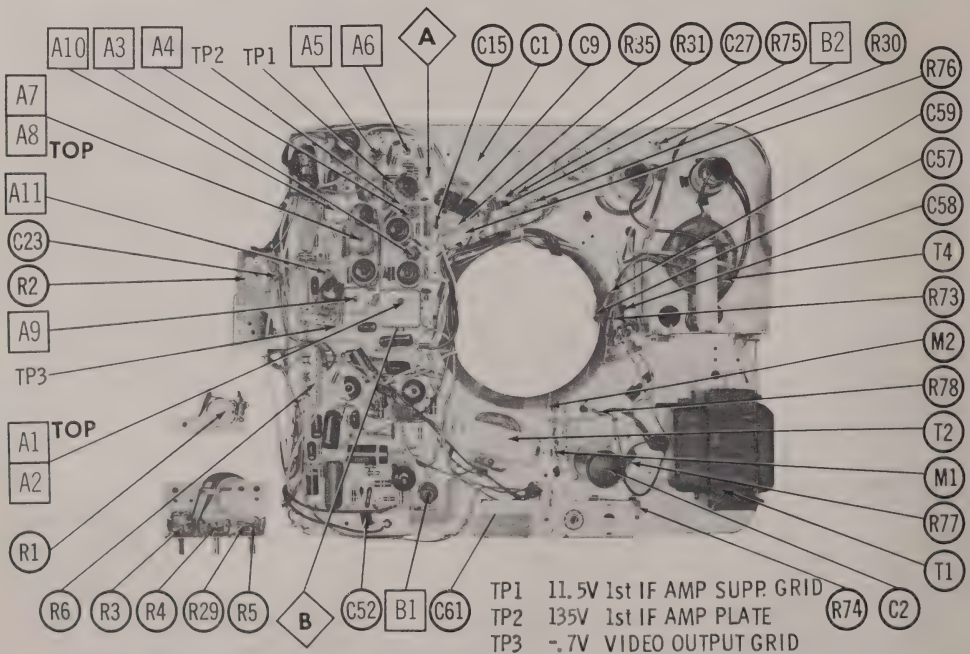
FIG. 202

RCA VICTOR CHASSIS KCS134A, KCS134B, KCS134C, KRS24C, KRT1B

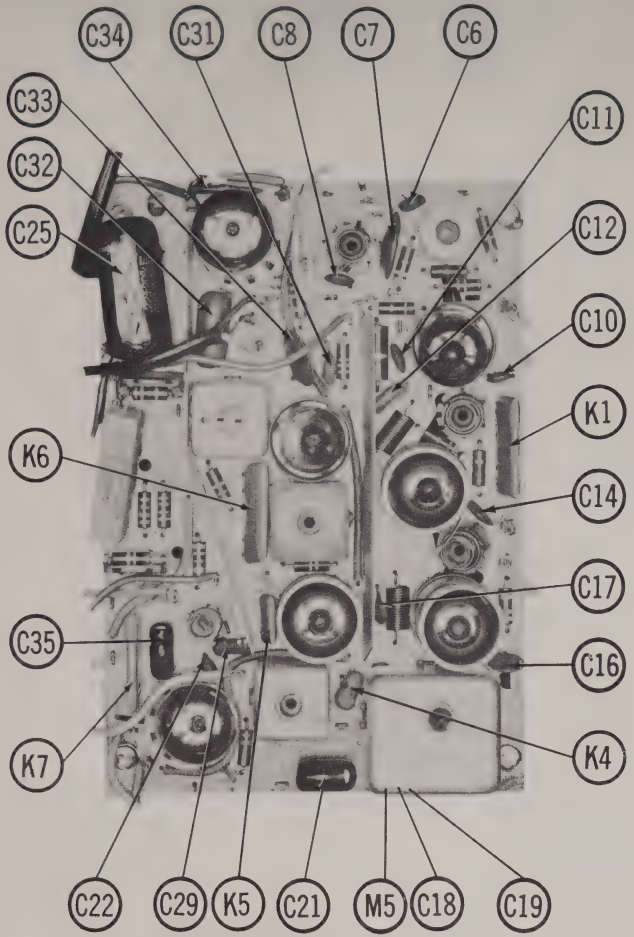
FOLDER 1



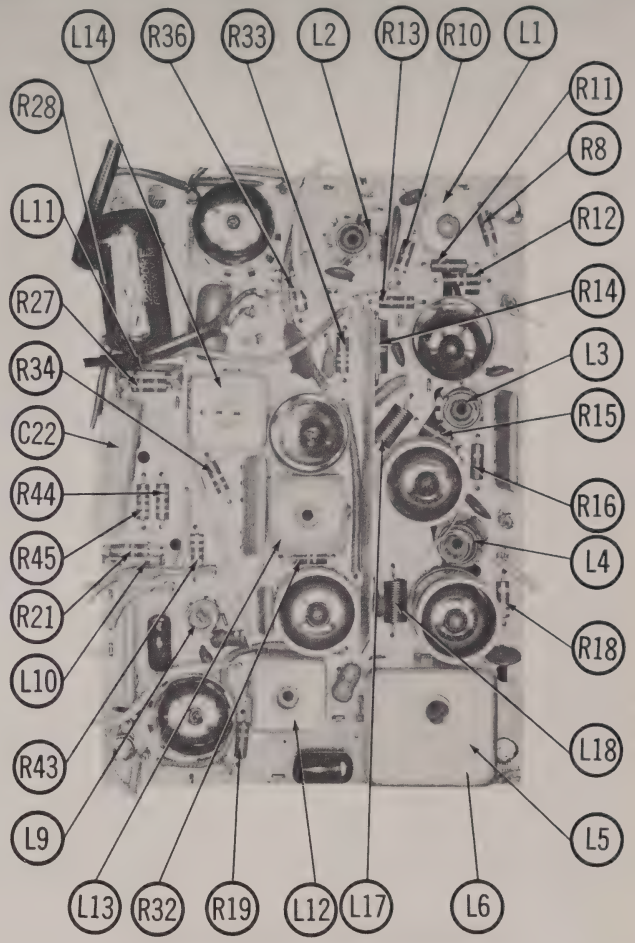
TV CHASSIS - FRONT VIEW



TV CHASSIS - REAR VIEW

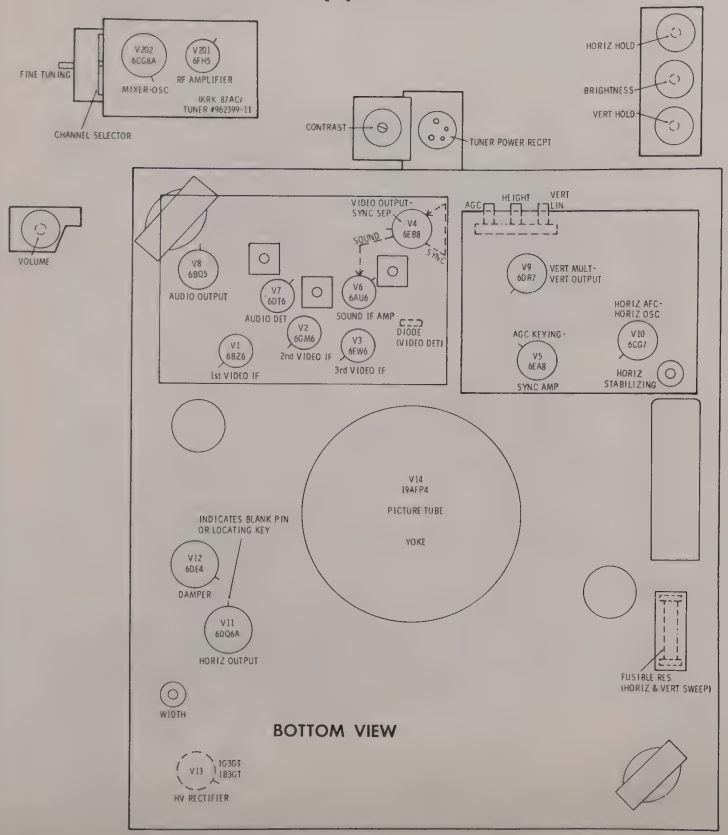


MAIN PRINTED BOARD
CAPACITOR & MISC. IDENT.



MAIN PRINTED BOARD
RESISTOR & INDUCTOR IDENT.

TUBE PLACEMENT CHART
TV

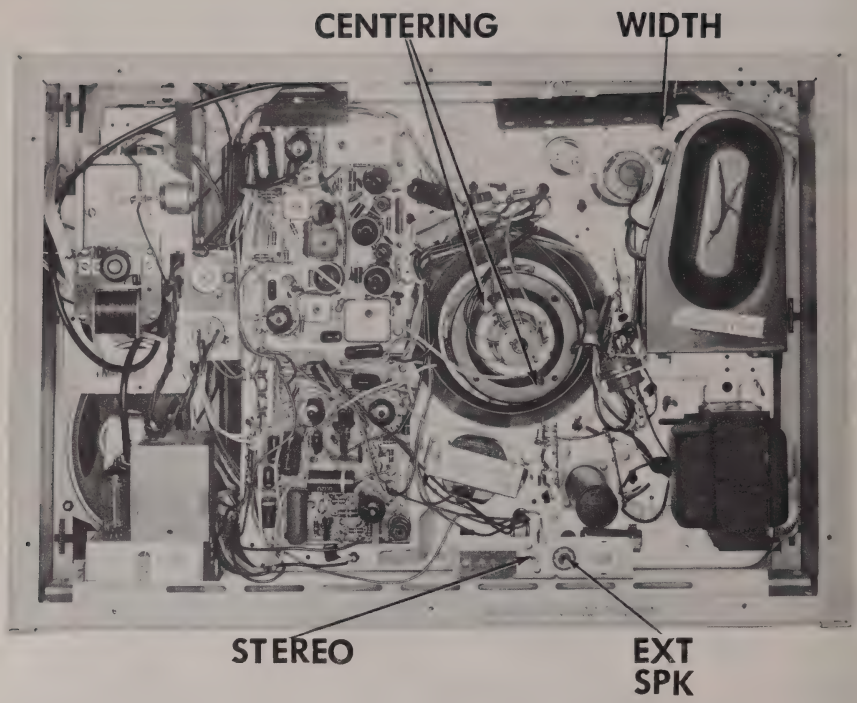


RESISTANCE MEASUREMENTS
TV

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	125K	1550Ω	0Ω	.1Ω	85K	85K	1500Ω		
V2	6GM6	70K	85K	0Ω	.1Ω	†280Ω	†280Ω	82K		
V3	6EW6	.1Ω	150Ω	.1Ω	0Ω	†3200Ω	†3200Ω	150Ω		
V4	6EB8	0Ω	4.9meg	†2.2meg	.1Ω	0Ω	27Ω	4200Ω	†18K	†7000Ω
V5	6EA8	†17K	• 70K	†60Ω	.1Ω	0Ω	520K	†6300Ω	0Ω	†560K
V6	6AU6	47K	0Ω	.1Ω	0Ω	†6800Ω	†6800Ω	82Ω		
V7	6DT6	4.2Ω	560Ω	0Ω	.1Ω	†560K	†9200Ω	470K		
V8	6BQ5	NC	• 15K	470Ω	0Ω	.1Ω	NC	†2600Ω	NC	†2200Ω
V9	6DR7	†200Ω	NC	• 1.8meg	0Ω	.1Ω	• †3.8meg	• 2.8meg	0Ω	330Ω
V10	6CG7	†60Ω	280K	400K	0Ω	.1Ω	†82K	• 80K	84Ω	0Ω
V11	6DQ6A	TP	0Ω	NC	†10K	1meg	TP	.1Ω	0Ω	TOP CAP †12Ω
V12	6DE4	NC	NC	4meg	NC	†60Ω	NC	.1Ω	0Ω	
V13	1G3GT 1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †450Ω
V14	19AFP4	0Ω	22K	†1.9meg	0Ω	NC	NC	• 200K	.1Ω	
V201	6FH5	47Ω	2.1meg	0Ω	.1Ω	†5700Ω	0Ω	47Ω		
V202	6CG8A	4700Ω	†9400Ω	0Ω	0Ω	.1Ω	†5700Ω	†4700Ω	0Ω	220K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM OUTPUT OF M1.
† MEASURED FROM PIN 3 OF V12.

NC NO CONNECTION
TP TIE POINT



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Before adjusting the Stabilizing Slug (B1), the Width must be properly adjusted.

Set the Horizontal Hold Control to the pull-in point. With the Brightness Control set to normal level, adjust the Width Slug (B2) for an overscan of approximately 3/4 inch on each side of the screen at normal line voltage. Connect a short jumper across the terminals of the Horizontal Stabilizer Coil (L19B) and short the grid (pin 2) of the 6CG7 (V10) to chassis with a small screw driver. Adjust the Horizontal Hold Control for an upright picture (may appear to float back and forth across the screen).

Remove the jumper from across L19B and adjust B1 to again obtain a picture in an upright position. When B1 is properly adjusted, alternately shorting and removing short should not cause the picture to lose sync but instead cause a slight sideways shift of the picture. Remove the short from the grid of the Horizontal Oscillator.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL 191BR254

1. Remove 10 metal screws holding rear cover.
2. Pull rear cover back far enough to disconnect antenna lead at the tuner.
3. Remove rear cover.
4. Remove 6 push-on type knobs at front of cabinet.
5. Remove picture tube socket, yoke plug, high voltage lead, and speaker leads.
6. Unplug tuner power cable and link cable.
7. Remove 2 screws holding control bracket to the cabinet.
8. Remove one screw holding on-off-volume control to tuner bracket.
9. Remove two nuts holding chassis (at top) to cabinet and remove TV chassis and remote control receiver chassis bolts at bottom of cabinet.
10. Remove TV chassis and remote control receiver.

PICTURE TUBE REMOVAL

It is necessary to remove the chassis for picture tube removal.

PHOTOFACT® Folder with CIRCUITRACE®

TRUETONE MODELS 2DC1144A, 2DC1146A, 2DC1148A

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

TRUETONE MODELS
2DC1144A, 2DC1146A, 2DC1148A

MODEL 2DC1144A

TRUETONE MODELS
2DC1144A, 2DC1146A, 2DC1148A

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TRUETONE MODELS 2DC1144A, 2DC1146A, 2DC1148A

TRUETONE MODELS 2DC1144A, 2DC1146A, 2DC1148A

MODEL 2DC1144A

TRUETONE MODELS 2DC1144A, 2DC1146A, 2DC1148A

TRADE NAME	Truetone Models 2DC1144A, 2DC1146A, 2DC1148A
SUPPLIER	Western Auto Supply Co., 2107 Grande Avenue, Kansas City, Mo.
TYPE SET	Television Receiver
TUBES	VHF - Seventeen, UHF - Eighteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING VHF - 180 Watts, 1.75 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

SAFETY GLASS

The safety glass is an integral part of the picture tube.

FUSE

A fuse wire is used for filament protection. (For location, see M3 in photo "Chassis - Bottom View".)

FUSE DEVICE

A 4.5Ω fusible resistor is used for low voltage power supply protection. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENT

To touch up the VHF Oscillator, it is necessary to remove rear cover.

AGC

The AGC may be varied by means of an AGC(Range)Control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by connecting the lead from pin 4 of the picture tube (thru 100K resistor) to various voltage points. (For location, see photo "Chassis - Top View".)

SYNC STABILITY

Sync stability may be varied by means of a Sync Stability Control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The Horizontal Frequency Slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

HORIZONTAL DRIVE

The horizontal drive may be varied by a Horizontal Drive Trimmer. (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz Control for MINIMUM buzz and maximum sound. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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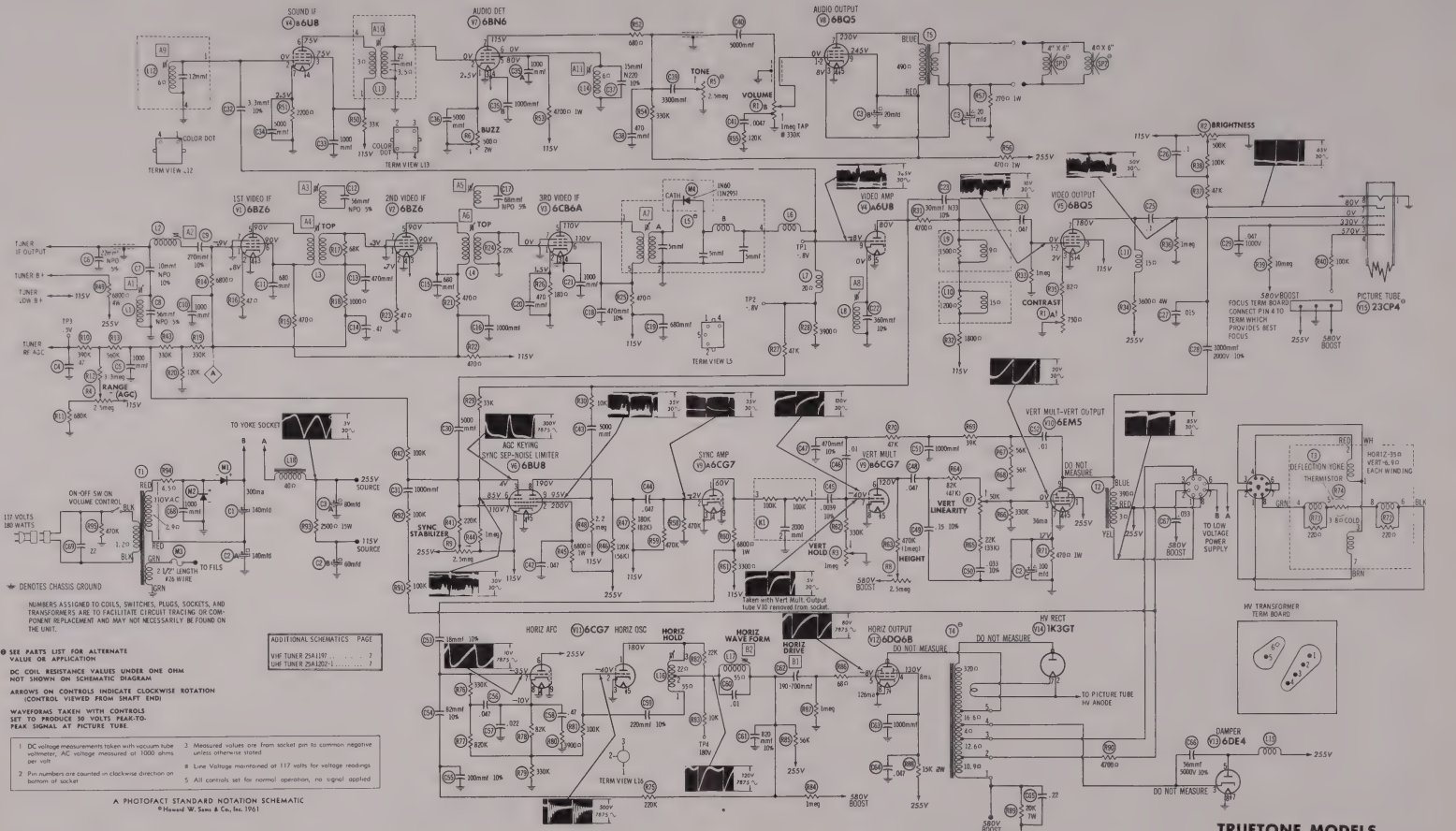
KA418R

SET 526 FOLDER 2



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE

ADDITIONAL SCHEMATICS	PAGE
VHF TUNER 25A197	7
UHF TUNER 25A202-1	7

1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt

2 Pin numbers are counted in clockwise direction on bottom of socket

3 Measured values are from socket pin to common negative unless otherwise stated

4 Line Voltage maintained at 117 volts for voltage readings

5 All controls set for normal operation, no signal applied

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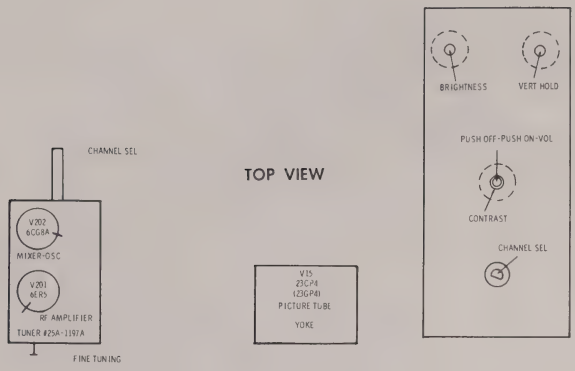
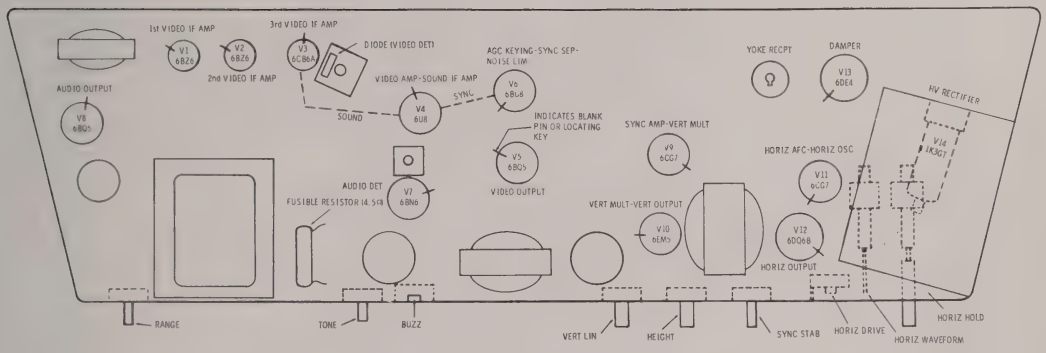
TRUETONE MODELS
2DC1144A, 2DC1146A, 2DC1148A

TUBE PLACEMENT CHART





TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor (4.5Ω), Rectifiers (B+)

SWEEP FAILURE
No raster, has sound V11, V12, V13, V14, V15
No vertical deflection V9, V10
Poor vert. linearity or foldover V9, V10
Poor horiz. linearity or foldover V11, V12, V13
Narrow picture V11, V12, V13, Rectifiers (B+)
Vert. off freq. V9, V10
Horiz. off freq. V11

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V5, V15
Has pic, no sound V4, V7, V8
Overloaded picture V6

SYNC FAILURE
No vert. sync V6, V9
No horiz. sync V6, V9
No vert. or horiz. sync V6, V9

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8282, 8606, 8505L or 9295
WALSCO #2543, 2544 or 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volt bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis.	44.0MC (10MC Swp.)	47.25MC	Any non-interfering channel	Vert. Amp. thru demodulator probe (Fig. 1) to pin 5 (plate) of 6BZ6 (V1). Low side to chassis.	A1	Adjust to place marker in trap notch as in Fig. 2.
2.	"	"	"	41.25MC 45.75MC 47.25MC	"	"	A2, A3, & Mixer Plate Coil	Adjust for response similar to Fig. 2. Mixer Plate Coil and A2 affect the shape of the top. A3 is adjusted to position the 47.25MC marker.
3.	"	"	"	42.8MC	"	Vert. Amp. thru 10K to TP-1. Low side to chassis. DC probe of VTVM thru 10K to same point. Common to chassis. (Across Video Det. Load)	A4	Increase bias at point (A) to 4.5 volts. Adjust sweep output for -2 volts DC at TP-1. Adjust A4 for maximum amplitude at marker.
4.	"	"	"	41.25MC	"	"	A5	Adjust for MINIMUM amplitude at marker.
5.	"	"	"	45.3MC	"	"	A6	Adjust for maximum gain at marker.
6.	"	"	"	44.0MC	"	"	A7	"
7.	"	"	"	41.25MC 42.4MC 42.8MC 44.0MC 44.5MC 45.3MC 45.75MC 47.25MC	"	"		Check for response similar to Fig. 3 with markers as shown. If necessary, retouch A2 thru A7 for desired response. A7 controls the symmetry of the top. A6 controls position of the 45.75MC marker. A4 controls position of the 42.4MC marker (this slug will seldom need retouching). CAUTION: The position of 44.5MC marker is very critical (98%).

4.5MC TRAP ALIGNMENT

Use 0-10 volts AC scale on VTVM.
Set Contrast fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.005mfd	High side to pin 9 (grid) of 6U8 (V4). Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	RF probe to pin 2 (grid) of picture tube. Common to chassis.	A8	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Tune in a TV signal and reduce signal level at the antenna terminals, by use of an attenuator or similar device, until a hiss similar to super-regeneration is heard in the sound.
Adjust A9, A10 and A11 for maximum undistorted sound.
Adjust the Buzz Control for MINIMUM buzz.

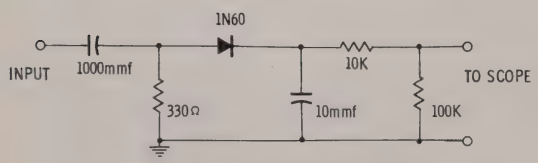


FIG. 1

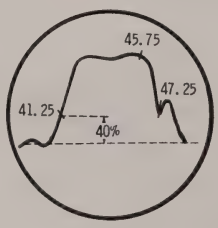


FIG. 2

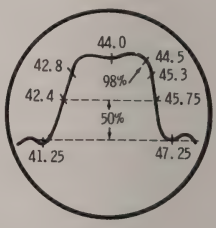
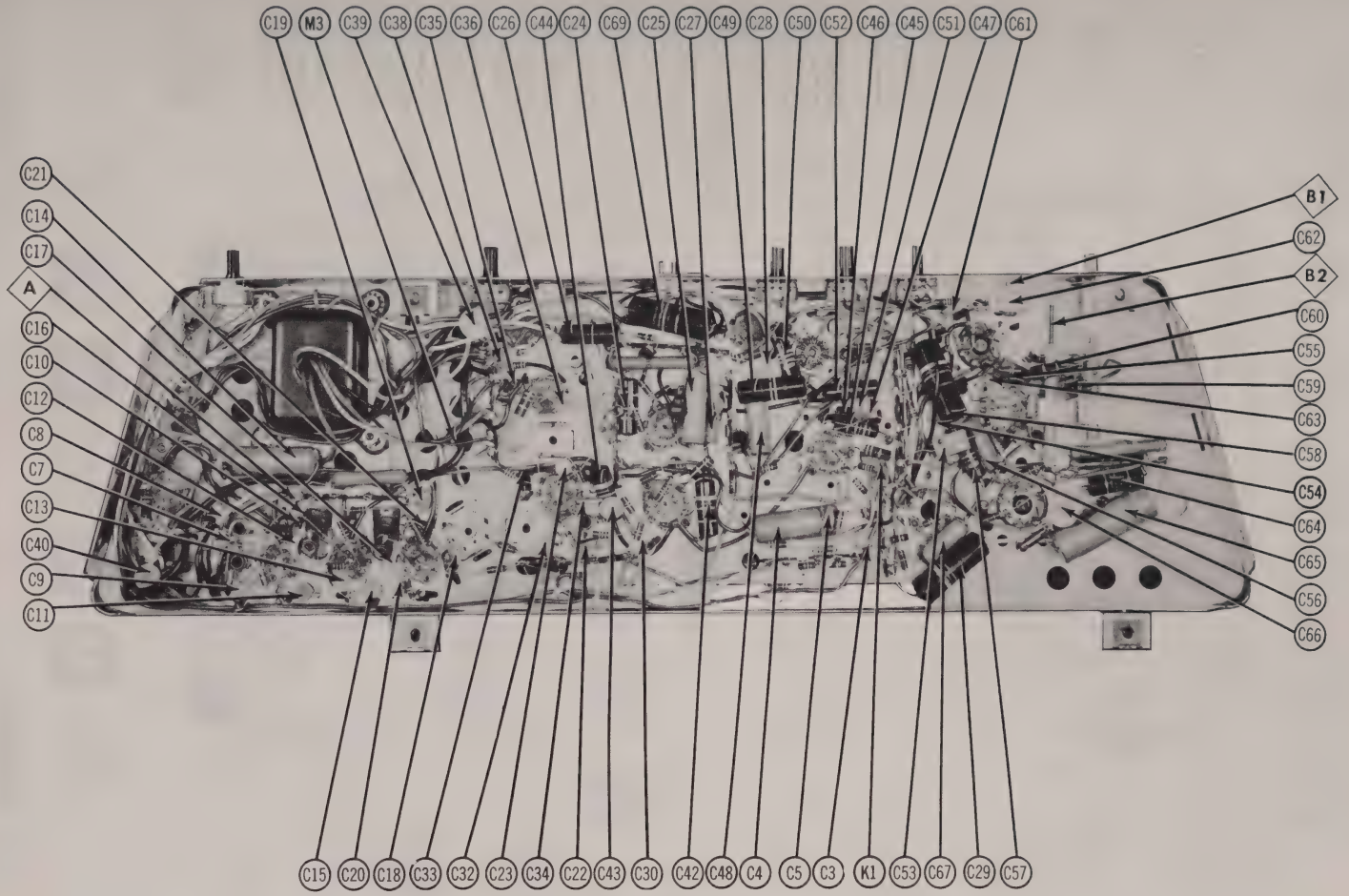
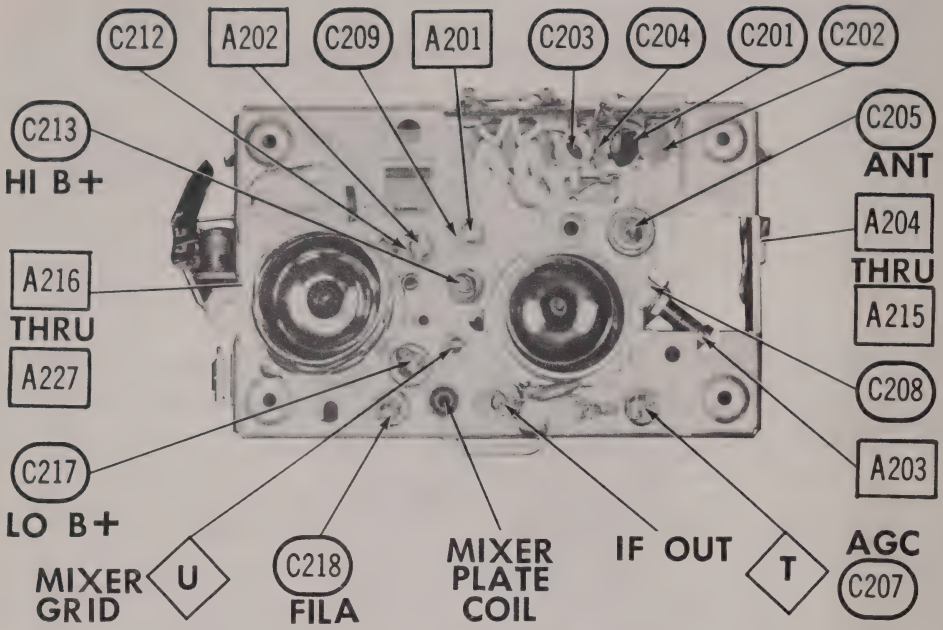


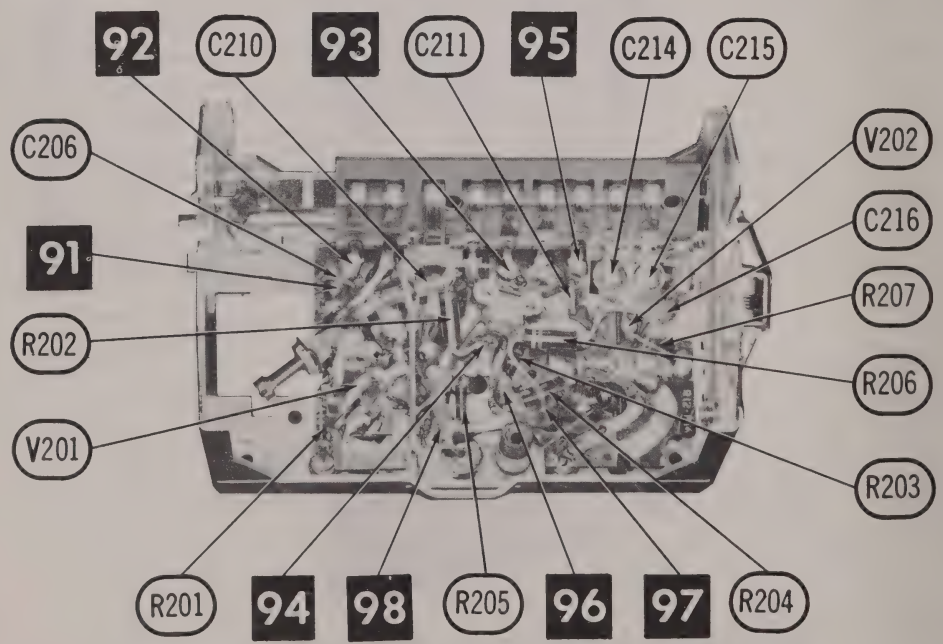
FIG. 3



CHASSIS BOTTOM VIEW - CAPACITOR, MISC., & ALIGN. IDENT.



VHF TUNER 25A1197 - TOP VIEW



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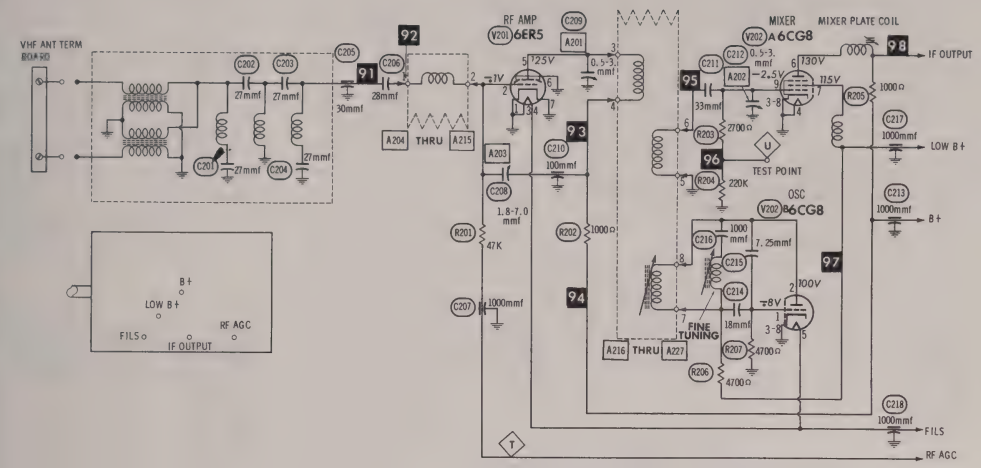
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

VHF TUNER 25A1197 - BOTTOM VIEW



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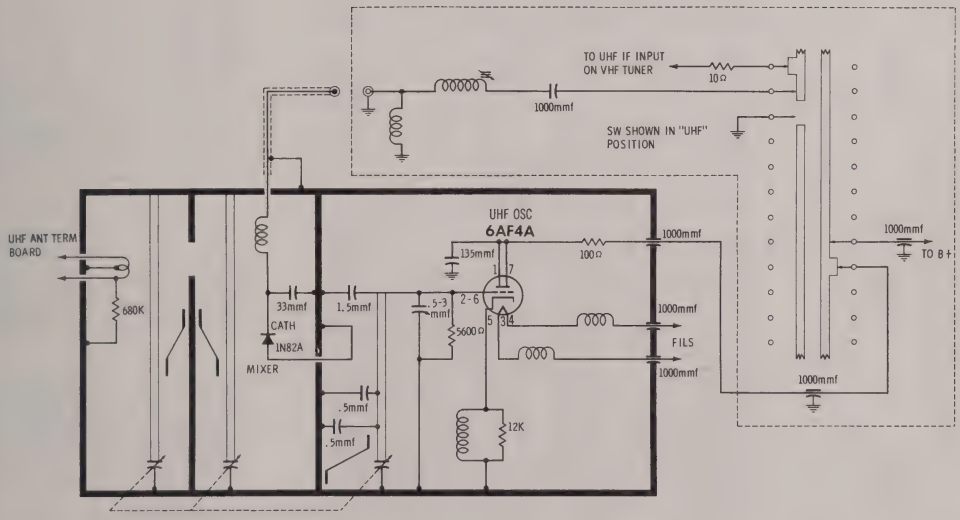
VHF TUNER 25A1197



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UHF TUNER 25A1202-1 & UHF POSITION SWITCH

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	GENERAL ELECTRIC • USE	GENERAL ELECTRIC • TYPE	ITEM No.	RAYTHEON • SYLVANIA • USE	RAYTHEON • SYLVANIA • TYPE
V1	1st Video IF Amp.	6BZ6	V7	Audio Detector	6BN6
V2	2nd Video IF Amp.	6BZ6	V8	Audio Output	6BQ5
V3	3rd Video IF Amp.	6CB6A	V9	Sync Amp. - Vert. Mult.	6CG7
V4	Video Amp. - Sound IF Amp.	6U8	V10	Vert. Mult. - Vert. Output	6EM5
V5	Video Output	6BQ5	V11	Horiz. AFC - Horiz. Osc.	6CG7
V6	AGC Keying - Sync Sep. - Noise Limiter	6BU8	V12	Horiz. Output	6DQ6B
			V13	Damper	6DE4
			V14	HV Rectifier	1B3GT

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: TRUETONE PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V15	23CP4 23GP4		23CP4 ① 23CP4 ①	23CP4 ③	23CP4 ③	① Aluminized ③ Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP	RATING: VOLT	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	140	150	45X421	AFSH-23	XA0361	FPU7	TMS-1370	TVL-1438	
C2A	40	150	45X464	AFH3-167-15	B0608	FP330.38	TMT-3410	TVL-3709.3	
B	60	350			BB0035	TC48	TD-150-150	TVA-1422	
C	100	50							
C3A	80	350	45X485	AFH-07	C0370	FP333.15	TMT-3763	TVL-3793	
B	20	350							
C	30	50							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.47	200V			P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C5	1000				BPD-001	DD-103	BYA10D1	CCD-103	B-210	5HK-D10
C6	22	NPO	5%			DTZ-22	CIQ223C	CM-19B-220J	CNO-422	10TCC-Q22
C7	10	NPO	10%		NPO-DI10	DTZ-10	CIQ1C	CCTO-100	CNO-410	10TCC-Q10
C8	56	NPO	5%			TCZ-56	CIQ565C	CM-19B-560J	CNO-456	10TCC-Q56
C9	270		10%		DI-270	DD-271	L10T27	CCD-271	GP327	10TB-T27
C10	1000				BPD-001	DD-103	BYA10D1	CCD-103	B-210	5HK-D10
C11	680				BPD-00068	DD-681	BYA10T68	CCD-681	B-368	10TB-T68
C12	56	NPO	5%			TCZ-56	CIQ565C	CM-19B-560J	CNO-456	10TCC-Q56
C13	470				BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TB-T47
C14	.47	200V			P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C15	680				BPD-00068	DD-681	BYA10T68	CCD-681	B-368	10TB-T68
C16	1000				BPD-001	DD-103	BYA10D1	CCD-103	B-210	5HK-D10
C17	56	NPO	5%			DTZ-56	CIQ565C	CM-19B-560J	CNO-456	10TCC-Q56
C18	470		10%		DI-470	DD-471	5HT47	CCD-471	GP347	10TB-T47
C19	680				BPD-00068	DD-681	BYA10T68	CCD-681	B-368	10TB-T68
C20	470				BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TB-T47
C21	1000				BPD-001	DD-103	BYA10D1	CCD-103	B-210	5HK-D10
C22	360		10%		1469-00036		5HT36	CM-19B-361K		M8-336
C23	30	N33	10%	#47Z869				CM-19B-300J		
C24	.047	400V			P488N-047		CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C25	.1	400V			P488N-1		DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C26	.1	200V			P288N-1		DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C27	.015	500V			P688N-015		DD-153	CUB6S15	6DP-2-153	GEM-615	6TM-S15
C28	1000	2000V	10%	#60Z98-1							
C29	.047	1000V			P1088N-047		CUB10S47	10DP-5-473	GEM-10047	10TM-S47
C30	5000				BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C31	1000				BPD-001	DD-103	BYA10D1	CCD-103	B-210	5HK-D10
C32	3.3		10%		NPO-SI 3.3	TCZ-3R3	CIQ33C	CCTO-3R3	CNO-533	10TCC-Y33
C33	1000				BPD-001	DD-103	BYA10D1	CCD-102	B-210	5HK-D10
C34	5000				BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C35A	1000				BPD-2X001	DD8-102	BYD8D1	CCD-102	B2X2I0	5HK-2I10
B	1000							CCD-102		
C36	5000				BPD-005	DD-502	BYA10D5	CCD-503	B-350	5HK-D50
C37	15	N220	10%	#47X672				*		10TCH-Q15
C38	470				BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TB-T47
C39	3300				BPD-0033	DD-332	BYA10D33	CCD-332	B-333	5HK-D33
C40	5000				BPD-005	DD-502	BYA10D5	CCD-503	B-350	5HK-D50
C41	.047	400V			P488N-0047	DE-473	CUB4D47	4DP-1-472	GEM-4247	4TM-D47
C42	.047	400V			P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C43	5000				BPD-005	DD-502	BYA10D5	CCD-503	B-250	5HK-D50
C44	.047	400V			P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C45	.0039	400V	10%		P684CM-0039		DPM6D39	6DP-1-392	JL-239	6PS-D39
C46	.01	200V			P488N-01	D6-103	CUB4S1	4DP-3-103	GEM-411	4TM-S10
C47	470		10%		DI-470	DD-471	5RT47	CCD-471	GP347	10TB-T47
C48	.047	600V			P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C49	.15	200V	10%		V94C2P15-10%		PM2P15	2DP-1-154	GEM-2015	2TM-P15
C50	.033	200V	10%		V94C2S33-10%		FM6S33	4DP-2-333	GEM-1613	6TM-S33
C51	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C52	.01	600V			P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10
C53	18		10%		1469-00018	TCZ-18	22S5Q18	CM-19B-180K	CNO-418	M8-418
C54	82		10%		1469-00082	TCZ-82	22S5Q82	CM-19B-820K	CNO-482	M8-482
C55	100		10%		1469-0001	TCZ-100	22S7I	CM-19B-101K	MCB23S	M8-310
C56	.047	200V			P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C57	.022	200V			P288N-022	DD-203	CUB4S22	4DP-2-223	GEM-4123	4TM-S22
C58	.47	200V			P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C59	220		10%		1469-00022	TCZ-220	22S7Z2	CM-19B-221K	CNO-321	M8-321
C60	.01	400V	10%		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C61	820		10%		1469-00082		5RT82	CM-19B-821K	MCB25I	M8-382
C62	180-700			#17A276				469		
C63	1000				BPD-001	DD-102	BYA10D1	CCD-103	B-210	5HK-D10
C64	.047	400V			P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C65	.22	600V			P688N-22		CUB6P22	6DP-5-224	GEM-6022	6TM-P22
C66	58	5000V	10%	#47X755					5DY-456	
C67	.033	600V			P688N-033	DD-303	CUB6S33	6DP-3-333	GEM-6133	6TM-S33
C68	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C69	.22	400V			P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22

Tructone Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	750Ω	1	78X38	F1-2				Contrast
B	1meg	1		RPS-57	RTV-724	† Q1-1519	* UE4188-S	Volume
C	Switch			Not Req.				Push-Push Off-On
R2A	500K	1	40X482	B-59	A47-500K-S	Q1I-133	U50	Brightness
B	Shaft			Not Req.	F2-3	Not Req.	Not Req.	
R3A	1meg	1	40X425	B-59	A47-1meg-S	Q1I-137	U54	Vert. Hold
B	Shaft			Not Req.	F2-3	Not Req.	Not Req.	
R4	2.5meg	1/2	40X466-2	TT-83	B47-2.5meg-S	HLC2	SU-565	Range (AGC)
R5	2.5meg	1/2	40X466-2	TT-83	B47-2.5meg-S	HLC2	SU-565	Tone Note I
R6	500Ω	2(WW)	40X472				U0-600	Buzz
R7A	50K	1	40X467-2	TT-31	B47-50K-S	B1I-123	PTA54L	Vert. Linearity
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R8	2.5meg	1/2	40X466-2	TT-83	B47-2.5meg-S	HLC2	SU-565	Height
R9	2.5meg	1/2	40X466-2	TT-83	B47-2.5meg-S	HLC2	SU-565	Sync Stabilizer

Note 1. Some versions may use 100K, (Part #40X468-2).
† "CONCENTRIKIT" Equivalent: K-48 Kit with Base Elements and Shafts: B1I-105, P17-113 (Panel). B13-137X, R23-205 (Rear).
* STA-LOC" Equivalent: FA75L, RUP16T254, OF1437.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R10	390K			
R11	680K			
R12	3.3meg			
R13	560K			
R14	6800Ω			
R15	470Ω			
R16	47Ω			
R17	68K			
R18	1000Ω			
R19	330K			
R20	120K			
R21	470Ω			
R22	470Ω			
R23	47Ω			
R24	22K			
R25	470Ω			
R26	180Ω			
R27	47K			
R28	3900Ω			
R29	33K			
R30	10K			
R31	4700Ω			
R32	1800Ω			
R33	1meg			
R34	3600Ω 4W	PW5-3600	4G-3600	#43X331
R35	82Ω			
R36	1meg			
R37	47K			
R38	100K			
R39	10meg			
R40	100K			
R41	220K			
R42	100K			
R43	330K			
R44	1meg			
R45	6800Ω 1W			
R46	120K			(56K) * (82K) *
R47	180K			
R48	2.2meg			
R49	6800Ω 4W	PW5-6800	4G-6800	#43X344
R50	33K			
R51	22000			
R52	680Ω			

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R53	4700Ω 1W			
R54	330K			
R55	120K			
R56	470Ω 1W			
R57	2700Ω 1W			
R58	470K			
R59	470K			
R60	6800Ω 1W			
R61	3300Ω			
R62	330K			
R63	470K			(1meg) *
R64	82K			(47K) *
R65	22K			(33K) *
R66	330K			
R67	56K			
R68	56K			
R69	39K			
R70	47K			
R71	470Ω 1W			
R72	220Ω			
R73	220Ω			
R74	3.5Ω (Cold)			
R75	220K			
R76	330K			
R77	820K			
R78	82K			
R79	330K			
R80	3900Ω			
R81	100K			
R82	22K			
R83	10K			
R84	1meg			
R85	56K			
R86	68Ω			
R87	1meg			
R88	15K 2W			
R89	20K 7W	PW7-20K	TW-SQ-20K	#43X354
R90	4700Ω			
R91	100K			
R92	100K			
R93	2500Ω 15W	PW15-2500	15W-SQ-2500	#43X313
R94	4.5Ω	F 4.5	F 4.7	#43X396
R95	470K			

Tructone Part Number. * Alternate Value.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	TRUETONE PART No.	REPLACEMENT DATA
X1	Vert. Integrator	2000mmf, 100K, 100K	76X19	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	47.25MC Trap	9A3481	TV-153	6225	RTC-8556	T28	① Includes Complete Assy.
L2	1st Video IF	9A2365	TV-151	6226	RTC-8526	T32	② Wound on 1500Ω Resistor
L3A	2nd Video IF	9A2363		6222	RTC-8553	T225	③ Wound on 1200Ω Resistor
B	47.25MC Trap						
L4A	3rd Video IF	9A2414		6221	RTC-8552	T224	
B	41.25MC Trap						
L5A	4th Video IF	9A2370 ①					
B	Peaking (30uh)		TV-180	6178	RTC-8593	T301	
L6	Peaking (30uh)	9A2375	TV-180	6178	RTC-8593	T301	
L7	Peaking (360uh)	36A34	TV-190	6134	RTC-8578	T321	
L8	4.5MC Trap	9A3074	TV-151	1470	RTC-8603	T250	
L9	Peaking (80uh)	36A16 ②	TV-181 ▲	6172 ▲	RTC-8590 ▲	T303 ▲	▲ Parallel with 1500Ω Res.
L10	Peaking (190uh)	36A49 ③	TV-197 ▲	6154 ▲	RTC-8586 ▲	T312 ▲	▲ Parallel with 1200Ω Res.
L11	Peaking (190uh)	36A2	TV-197	6154	RTC-8586	T312	
L12	1st Sound IF	9A2434	TV-154	1470-A	RTC-8604	T247	
L13	2nd Sound IF	9A2368	TV-113	6203	RTC-8545	T235	
L14	Quadrature	9A2367	TV-121	1480	RTC-8605	T251	
L15	RF Choke (1.5uh)	9A2380	BC-582	4894	RTC-8516	T256	

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	Merit PART No.	Miller PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	Workman TV PART No.
L16	Horiz. Osc.	9A2481							
L17	Horiz. Waveform	9A2372	MWC-12	6315	QRC104	RTC-8628	HS-8	WLC-3	T110

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	RATINGS: DC RES.	RATINGS: INDUCTANCE @ CURRENT 1000 (^)	REPLACEMENT DATA: TRUETONE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L18	.300A	40Ω	1 Hy.	52X104		C-2343①	26C44	C-32X	① Drill new mounting hole(s).

TRANSFORMER (POWER)

ITEM No.	RATING	REPLACEMENT DATA: TRUETONE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	PRI. 117V @ 1.75A / SEC. 1 6.3V @ 1A AC / SEC. 2 @ 9A	53X383				R-124BA	

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	Merit PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	Vert. Output	51X209					A-160X	
T3	Yoke (Horiz. 15.8MH) (10^6) (Vert. 13.8MH)	54X476 ①						
	Yoke Clamp	30X625						
T4	Horiz. Output	53X382A					D-153 * ②	
	Alt. Horiz. Output	53X382						

① Includes Rear Cover and Centering Device.
② Terminals #6, 8 and 7 not used. Cut out high voltage cage or cut and tape Terminals #6, 8 and 7.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

ORIGINAL TERMINAL CONNECTIONS	Merit Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
5					1
4					2
3					3
2					4
1					8

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: TRUETONE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	6300Ω	3-4Ω	51X208	A-3026	A-3550①	24S81 ①	S-46X	① Drill new mounting hole(s).

SPEAKER

ITEM No.	TYPE: SIZE	TYPE: FIELD	TYPE: V. C. IMP.	REPLACEMENT DATA: TRUETONE PART No.	QUAM PART No.	NOTES
SP1	4" x 6"	PM	8Ω	12A596A	46A1Z6.4	
SP2	4" x 6"	PM	6-8Ω	12A596A	46A1Z6.4	
	4" x 6"	PM		12AS98 *		* May be used in some versions.

POWER RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: TRUETONE PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.300A	66X23 *	1N1763 *	40H *	8R500 *	* Silicon
M2	.300A	66X23 *	1N1763 *	40H *	8R500 *	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: TRUETONE PART No. FUSE	TRUETONE PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M3	2½" length	626 wire.						

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: TRUETONE PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M4	1N60 or 1N295			1N60 1N295	1N60 1N295	Video Detector (Pigtail)

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M5	Tuner	25A1197	VHF with UHF Provisions (STANDARD COIL REPLACEMENT #GG4220A)
	Tuner	25A1202-1	UHF

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	10A1005-2	VHF Channel Selector
Knob	9A998-2	UHF Channel Selector
Knob	9A999-1	UHF Channel Indicator
Knob	10A1004	Fine Tuning
Knob	10A932-1	Volume
Knob	10A933-1	Contrast
Knob	10A1006-1	Brightness, Vertical Hold
Knob	10A1018-1	Horizontal Hold

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

TUNER PARTS LIST AND DESCRIPTIONS

25A1197

TUBES

• GENERAL ELECTRIC •			• RAYTHEON •		• SYLVANIA •	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	6ER5	V202	Mixer - Osc.	6CG8 (6CG8A)*

*Alternate

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	27		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C202	27		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C203	27		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C204	27		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C205	30							
C206	28							
C207	1000		EF-001	MFT-1000		CCF-102	CT280A	
C208	1.8-7.0			829-7				
C209	0.5-3.0			829-3		CV-1	CT565	
C210	100		EF-0001	MFT-100				
C211	33							
C212	0.5-3.0			829-3		CV-1	CT565	
C213	1000		EF-001	MFT-1000		CCF-102	CT280A	
C214	18							
C215	7.25							
C216	1000		DI-1000	DD-102	L10D1	CCD-102	GP210	10TS-D10
C217	1000		EF-001	MFT-1000		CCF-102	CT280A	
C218	1000		EF-001	MFT-1000		CCF-102	CT280A	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R201	47K				R205	1000Ω			
R202	1000Ω				R206	4700Ω			
R203	2700Ω				R207	4700Ω			
R204	220K								

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage Lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201, A202, A203 .... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a variable bias supply to point Ⓣ . Positive to chassis. Set bias for 2.5 volts.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point Ⓤ . Low side to chassis.	A201, A202, A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
2.	"	213MC	211.25MC 215.75MC	13	"	A204	Adjust for maximum amplitude of response similar to Fig. 201. Adjust by expanding or compressing coil turns.
		207MC	205.25MC 209.75MC	12		A205	
		201MC	199.25MC 203.75MC	11		A206	
		195MC	193.25MC 197.75MC	10		A207	
		189MC	187.25MC 191.75MC	9		A208	
		183MC	181.25MC 185.75MC	8		A209	
		177MC	175.25MC 179.75MC	7		A210	
		85MC	83.25MC 87.75MC	6		A211	
		79MC	77.25MC 81.75MC	5		A212	
		69MC	67.25MC 71.75MC	4		A213	
		63MC	61.25MC 65.75MC	3		A214	
		57MC	55.25MC 59.75MC	2		A215	

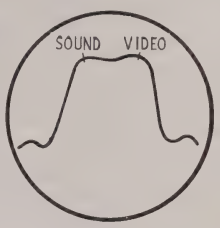


FIG. 201

VHF OSCILLATOR ALIGNMENT

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Det. Load.	A216	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
		207MC	205.25MC 209.75MC	12		A217	
		201MC	199.25MC 203.75MC	11		A218	
		195MC	193.25MC 197.75MC	10		A219	
		189MC	187.25MC 191.75MC	9		A220	
		183MC	181.25MC 185.75MC	8		A221	
		177MC	175.25MC 179.75MC	7		A222	
		85MC	83.25MC 87.75MC	6		A223	
		79MC	77.25MC 81.75MC	5		A224	
		69MC	67.25MC 71.75MC	4		A225	
		63MC	61.25MC 65.75MC	3		A226	
		57MC	55.25MC 59.75MC	2		A227	

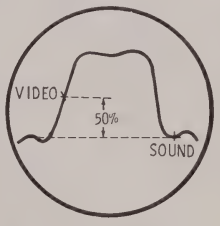
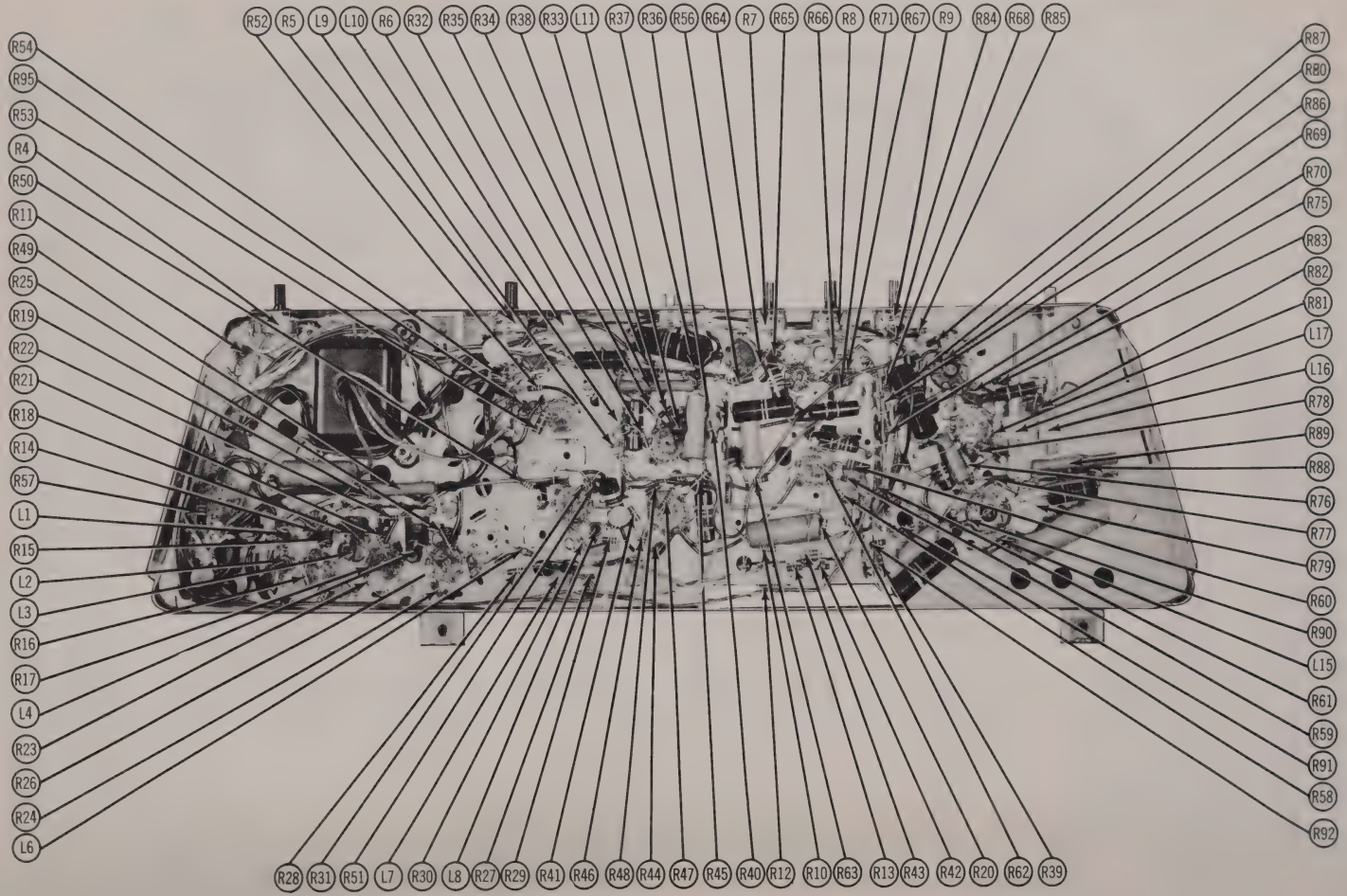
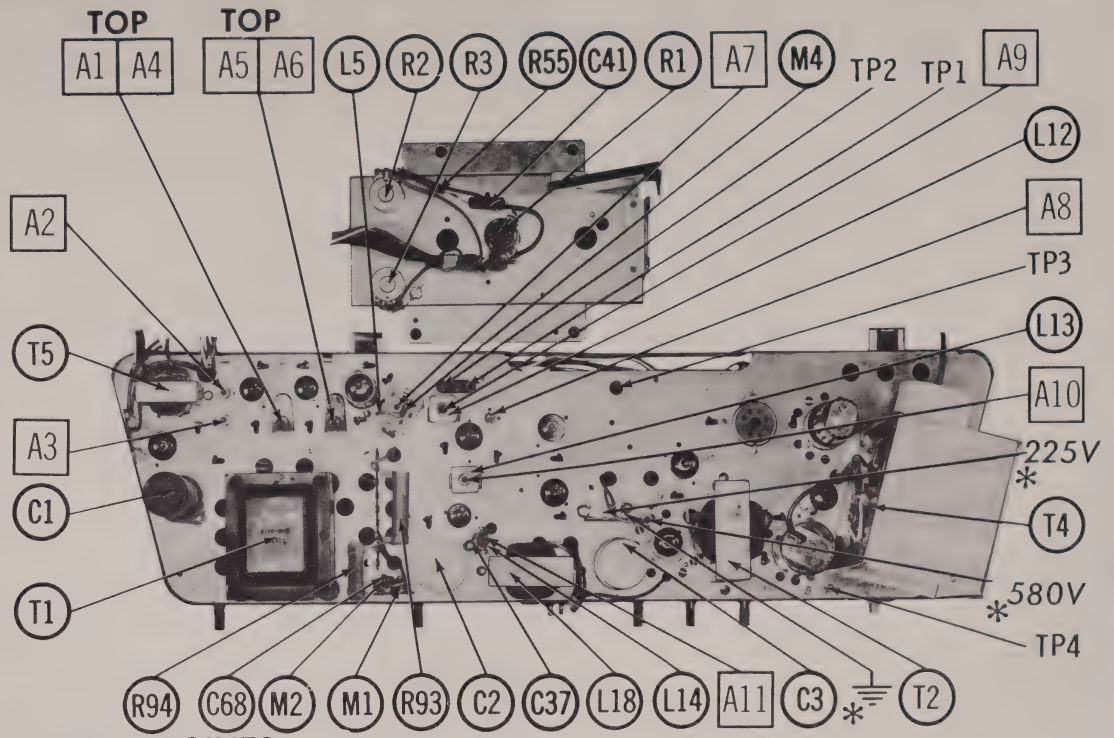


FIG. 202



CHASSIS BOTTOM VIEW-RESISTOR & INDUCTOR IDENT.

TP1 -.8V VIDEO AMP GRID
TP2 -.8V SYNC TAKEOFF
TP3 .5V AGC
TP4 180V HORIZ WAVEFORM



*FOCUS POINTS

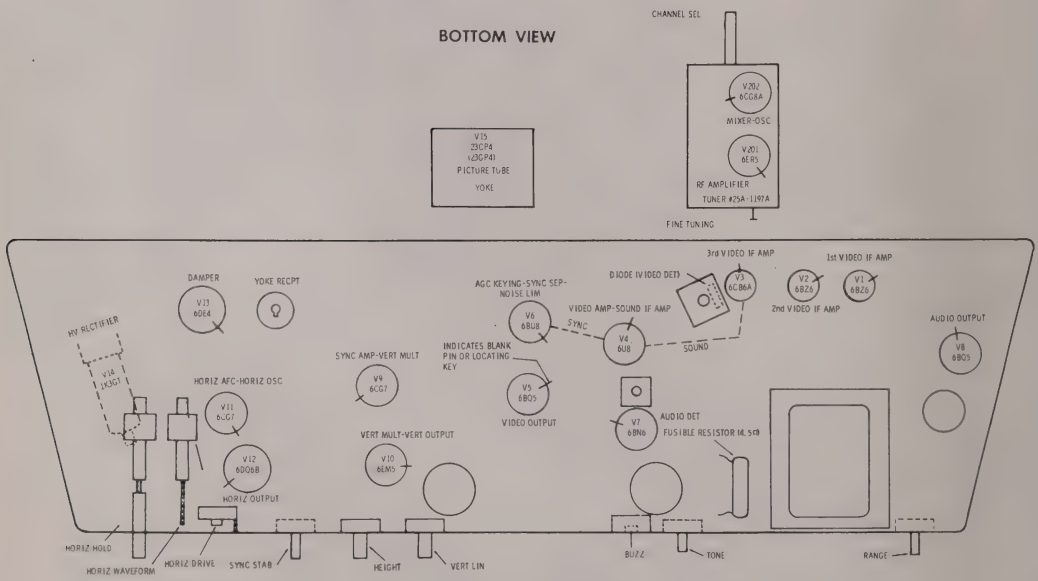
CHASSIS - TOP VIEW

RESISTANCE MEASUREMENTS

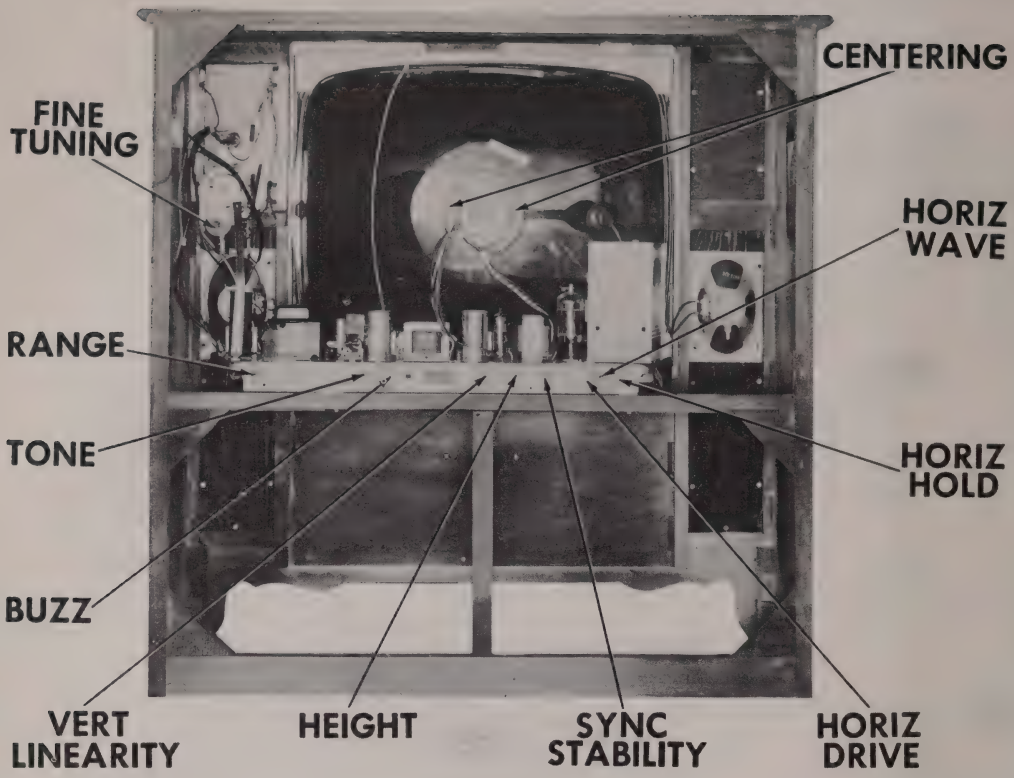
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	457K	47Ω	.1Ω	0Ω	†3500Ω	†3500Ω	0Ω		
V2	6BZ6	450K	47Ω	.1Ω	0Ω	†3500Ω	†3500Ω	0Ω		
V3	6CB6A	0Ω	180Ω	0Ω	.1Ω	†3000Ω	†3000Ω	0Ω		
V4	6U8	†9000Ω	6Ω	†35K	.1Ω	0Ω	†35K	2200Ω	0Ω	3900Ω
V5	6BQ5	NC	1meg	● 100Ω	.1Ω	0Ω	NC	†3600Ω	NC	†2500Ω
V6	6BU8	†2500Ω	†6800Ω	600K	0Ω	.1Ω	†42K	●†250K	†70K	†2.2meg
V7	6BN6	● 300Ω	3.5Ω	0Ω	.1Ω	†7200Ω	6Ω	†330K		
V8	6BQ5	● 0Ω	NC	270Ω	0Ω	.1Ω	NC	†1000Ω	NC	†510Ω
V9	6CG7	†12K	350K	0Ω	0Ω	.1Ω	● †1.1meg	●600K	0Ω	0Ω
V10	6EM5	†40Ω	TP	330K	0Ω	.1Ω	NC	470Ω	NC	†430Ω
V11	6CG7	†56K	430K	0Ω	0Ω	.1Ω	†40Ω	1.5meg	410K	0Ω
V12	6DQ6B	TP	0Ω	TP	†15K	1meg	TP	.1Ω	0Ω	TOP CAP †16Ω
V13	6DE4	NC	NC	¶	NC	†40Ω	TP	.1Ω	0Ω	
V14	1K3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †335Ω
V15	Z3CP4	0Ω	1meg	† 10meg	† 100K	NC	NC	●300K	.1Ω	
V201	6ER5	0Ω	1meg	0Ω	.1Ω	†7800Ω	0Ω	0Ω		
V202	6CG8A	4700Ω	†7500Ω	0Ω	0Ω	.1Ω	†7800Ω	†2500Ω	0Ω	223K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM OUTPUT OF M1.
† MEASURED FROM PIN 3 OF V13.

NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Tune in a station and adjust the Horizontal Hold until the picture is just about to tear out of sync as can be seen at the top of the picture.

Turn the Contrast Control fully counterclockwise and the Brightness Control clockwise so that the picture appears washed out. Turn the Horizontal Drive Trimmer (B1) clockwise until white vertical bars (drive lines) appear in the left center portion of the raster, then counterclockwise until the white bars just disappear.

Connect the Vertical Amplifier of the scope to TP-4. Low side to chassis. Adjust the Horizontal Waveform Slug (B2) until the round and sharp peaks of the waveform are equal in amplitude. See Fig. 4. Keep the picture in sync during this adjustment.

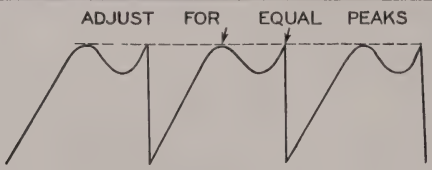


FIG. 4

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL WG-5203A

1. Remove 8 wood screws holding rear cover.
2. Remove 5 push-on type knobs in front of cabinet.
3. Remove antenna leads, speaker leads, picture tube socket, yoke plug, and high voltage lead.
4. Remove 4 screws holding control panel.
5. Remove 4 chassis bolts.
6. Remove chassis.

PICTURE TUBE REMOVAL

It is necessary to remove the chassis for picture tube removal.

PHOTOFACT® Folder

**PRODUCTION CHANGE
BULLETIN 257**

PRODUCTION CHANGE
BULLETIN 257

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 5 IN SET 452

AMPEX MODELS 950 SERIES (REVISED), 970 SERIES

Ampex Models 952, 954, 960 were covered in PHOTOFACT Folder 5 - Set 452.

Models 950 Series (Revised), 970 Series are electrically similar except for the following changes.

COMPONENT CHANGES

R8 is decreased from 100K 5% to 91K 5%.

R9 is increased from 100K 5% to 180K 5%.

R20 is decreased from 100K 5% to 91K 5%.

R21 is increased from 100K 5% to 180K 5%.

V5 (AF Amp.) is changed from a Type ECC82/12AU7 to a Type 12AT7.

The 560K Resistor and .002mfd Capacitor connected from Pin 7 of V5A are changed to 220K Resistor, .0082mfd Capacitor.

R42 is decreased from 300K to 100K.

The 560K Resistor and the .002mfd Capacitor connected from Pin 7 of V7A are changed to a 220K Resistor, and a .0082mfd Capacitor.

V7 (AF Amp.) is changed from a Type ECC82/12AU7 to a Type 12AT7.

COMPONENTS ADDED

A .02mfd Capacitor is added across M4 (Off-On Switch).

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 15 IN SET 513

SYLVANIA MODELS 4P15T, 4P15W (CH. 661-1)

Sylvania Model 4P14 (Ch. 661-1) was covered in PHOTOFACT Folder 15 - Set 513.

Models 4P15T, 4P15W are electrically similar except for the following changes.

COMPONENT CHANGES

R1 (Volume Control) is changed to Part #152-0070.

L1 (Loopstick Antenna) is changed to Part #581-0039.

M2 (Tuning Cap.) is changed to Part #170-0070.

SP1 (Speaker) is changed to Part #539-0357.

Ch. 661-1 Code 03

TO IMPROVE SENSITIVITY AT 540KC

R8 is decreased from 6800Ω to 3900Ω.

C3 is decreased from .02 to .005mfd.

Ch. 661-1 Code 04

TO IMPROVE SENSITIVITY AT 540KC

L2 (Osc. Coil) is changed to Part #113-0087.

(Continued On The Reverse Side)

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SET 526 FOLDER 3

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	740-0466	Volume, Model 45P15T
Knob	740-0467	Volume, Model 45P15W
Knob	741-0112	Tuning, Model 45P15T
Knob	741-0113	Tuning, Model 45P15W
Cabinet Back	822-0156	Model 45P15T
Cabinet Back	822-0157	Model 45P15W
Cabinet Front	822-0154	Model 45P15T
Cabinet Front	822-0155	Model 45P15W

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 2 IN SET 500

SYLVANIA MODELS 17P14 SERIES (CH. 547-1, -2)

Sylvania Models 17B110, 17M101, 17P11 Series (Ch. 547-1, -2) were covered in PHOTOFACT Folder 2 - Set 500.

Model 17P14 Series (Ch. 547-1, -2) are electrically similar except for the following changes.

Ch. 547-1, -2 Code 02

COMPONENT CHANGES

M1 & M2 (Selenium Rectifiers) are replaced with a single unit Silicon Rectifier Combination (Part #517-0021).

COMPONENTS ADDED

A 4.7Ω 15 Watt Resistor is added between M3 and R75.

A .001mfd Capacitor is added from the Junction of C1 and M1 to Ground.

A .001mfd Capacitor is added from the Output of M1 to Ground.

Ch. 547-1, -2 Code 03

COMPONENT CHANGES

K6 (Horiz. AFC Comp.) is changed to Part #190-0062.

K7 (Horiz. Mult. Plate) is changed to Part #190-0061.

R64 is decreased from 10K to 3900Ω.

R66 is increased from 1000Ω to 1200Ω.

C51 is omitted.

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 18 IN SET 493

WESTINGHOUSE MODELS H-67ACS1, H-67ACS2 (CH. V-2507-5)

Westinghouse Models H-56ACS1, H-56ACS2 (Ch. V-2507-2) were covered in PHOTOFACT Folder 18 - Set 493.

Models H-67ACS1, H-67ACS2 (Ch. V-2507-5) are electrically similar except for the following changes.

COMPONENT CHANGES

R1A, R1B are increased from 1meg to 2meg (Part #270V107H01).

R2A, R2B are changed to Part #270V107H03.

R3A, R3B are changed to Part #270V107H02.

R4 is changed to Part #270V107H04.

A partial schematic diagram is given in this bulletin, showing a different speaker hook-up.

COMPONENTS ADDED

A 470K ½ Watt Resistor (Part #270V224A74) is added from the center arm of R1A to Ground.

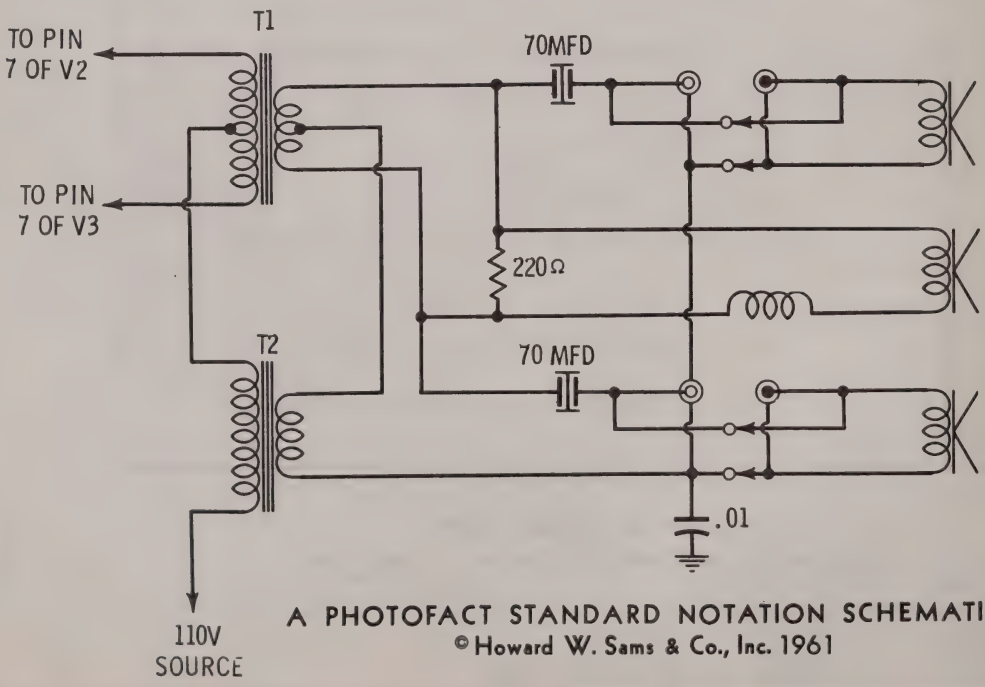
A 470K ½ Watt Resistor (Part #270V224A74) is added from the center arm of R1B to Ground.

(Continued On The Reverse Side)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	550V118H05	All Controls
Cabinet	516V256H01	Model H-67ACS1
Cabinet	516V256H02	Model H-67ACS2
Cabinet	517V016H05	Speaker Enclosure, Right Side
Cabinet	517V016H06	Speaker Enclosure, Left Side



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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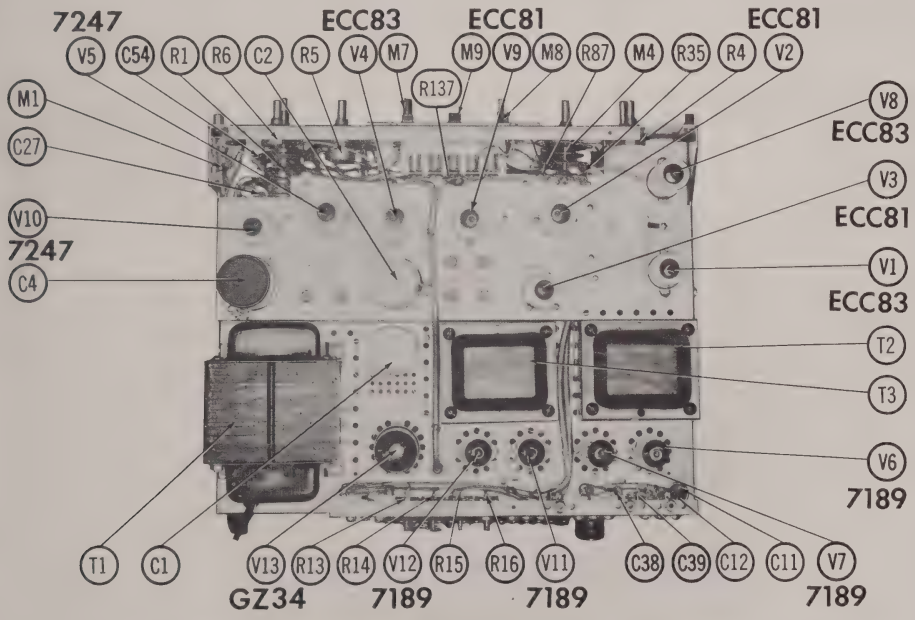
PHOTOFACT® Folder

FISHER
MODEL X-202

FISHER
MODEL X-202

TRADE NAME	Fisher Model X-202
MANUFACTURER	Fisher Radio Corp., 21-21 44th Drive, Long Island City 1, N. Y.
TYPE SET	AC Operated 13 Tube Stereo Amplifier
POWER SUPPLY	105 – 120 Volts AC. 50-60 Cycles RATING 160 Watts. 1.5 Amp. @117 Volts AC

FISHER
MODEL X-202



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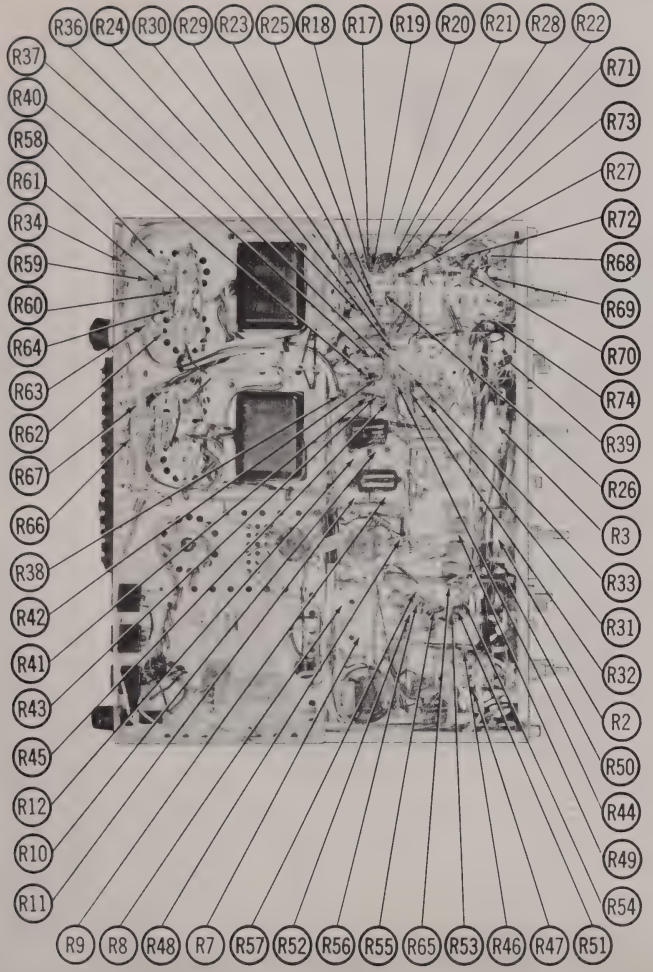
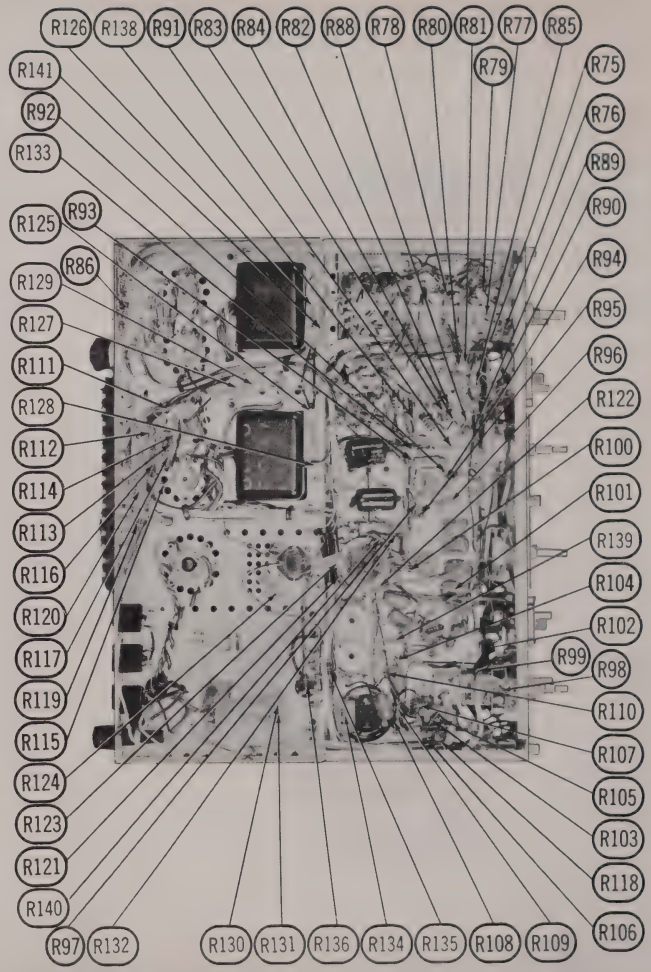
KV373

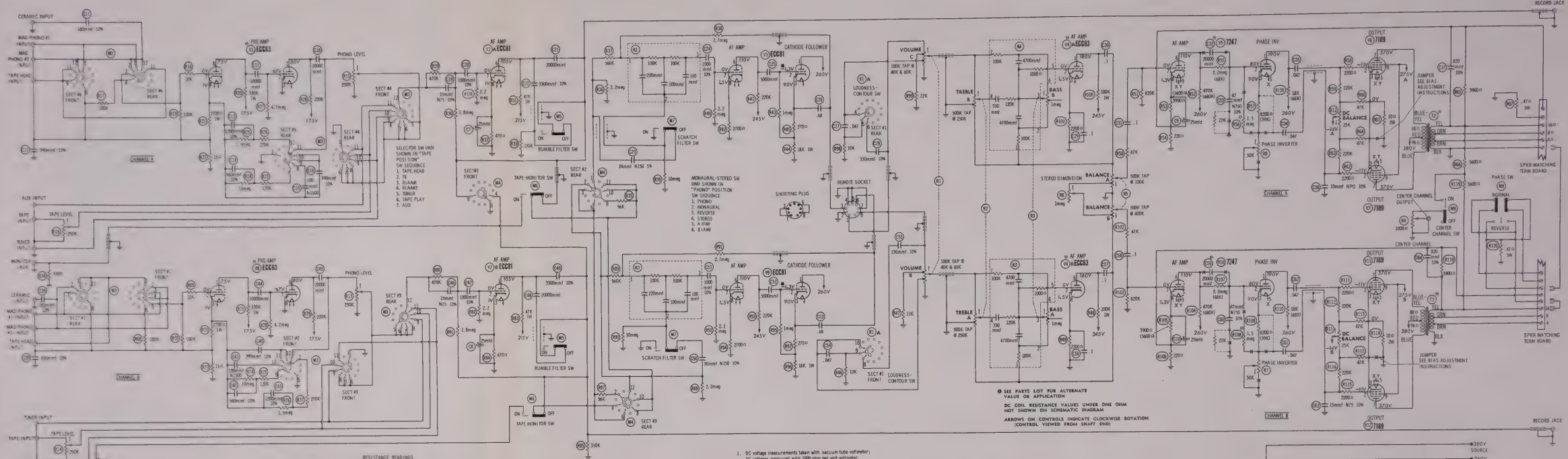
SET 526 FOLDER 4



CHASSIS-BOTTOM VIEW-RESISTOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



● SEE PARTS LIST FOR ALTERNATE VALUE ON APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83 12AX7	†260K	4.7meg	0Ω	8Ω	0Ω	†370K	100K ●60K	2700Ω	7Ω
V2	ECC81 12AT7	†58K	2.2meg	470K	8Ω	0Ω	†58K	2.2meg	470Ω	NC
V3	ECC81 12AT7	†4500Ω	1meg	18K	11Ω	8Ω	†227K	2.2meg	2700Ω	NC
V4	ECC83 12AX7	†165K	325K	2200Ω	11Ω	8Ω	†165K	320K	2200Ω	NC
V5	7247	†32K	1.5meg	32K	110Ω	110Ω	†475K	820K	4100Ω	110Ω
V6	7189	NC	260K	0Ω	110Ω	110Ω	NC	†210Ω	NC	†4100Ω
V7	7189	NC	260K	0Ω	110Ω	110Ω	NC	†220Ω	NC	†4100Ω
V8	ECC83 12AX7	†370K	110K +60K	2700Ω	8Ω	0Ω	†260K	4.7meg	0Ω	7Ω
V9	ECC81 12AT7	†4500Ω	1meg	18K	11Ω	8Ω	†227K	2.2meg	2700Ω	NC
V10	7247	†32K	1.5meg	32K	110Ω	110Ω	†475K	820K	4100Ω	110Ω
V11	7189	NC	260K	0Ω	110Ω	110Ω	NC	†210Ω	NC	†4100Ω
V12	7189	NC	260K	0Ω	110Ω	110Ω	NC	†220Ω	NC	†4100Ω
V13	GZ34 5AR4	NC	‡	NC	44Ω	NC	46Ω	NC	-	‡

† THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
‡ MEASURED FROM PIN 8 OF V13.
● MEASURED FROM CATHODE.
▲ MEASURED WITH SELECTOR IN ANY POSITION EXCEPT TAPE HEAD.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

ADJUSTMENTS

The adjustments should be made in the order outlined below. Turn the Level Set controls on rear panel fully counter-clockwise, Mono-Stereo switch to Stereo, Selector to appropriate position, Tape switch to Record and all other controls to Off, Normal or Flat position.

BIAS ADJUSTMENT

Unsolder one end of the shorting wire of R81 and R84 (10 ohm) in the cathode circuits of Output tubes. Connect a VTVM across the resistor in Channel A. Adjust Channel A Bias Adjust control for 0.8 volts. Repeat the procedure for Channel B.

Recheck Channel A. Do not resolder the wires if the next adjustment is to be performed.

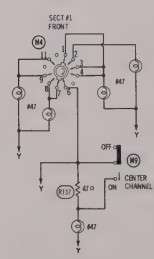
DC BALANCE ADJUSTMENT

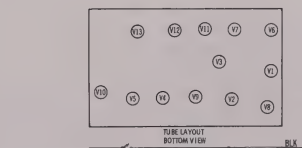
Connect the VTVM across speaker terminals G and 16 in Channel A. Adjust Channel A DC Balance for MINIMUM deflection. This should be 0.5 millivolts or less.

Repeat procedure for Channel B using terminals G and 16, and adjusting Channel B DC Balance control. Resolder the wires across R81 and R84.

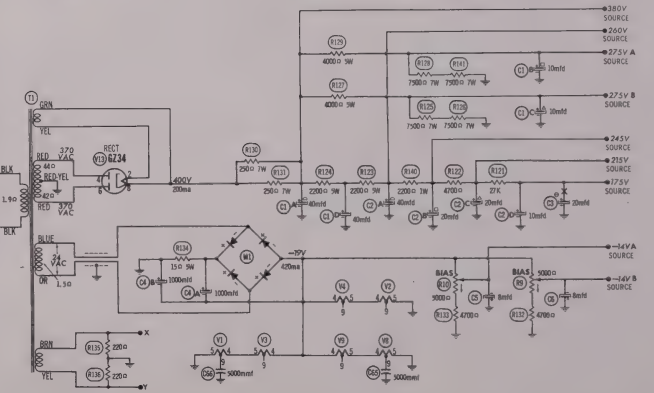
PHASE INVERTER ADJUSTMENT

Precise adjustments can be made only with an Intermodulation Analyser and Audio Generator. In lieu of these instruments, set Phase Inv. controls to mid-position.





NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.



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FISHER
MODEL X-202

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (GENERAL ELECTRIC • RAYTHEON • SYLVANIA)
V1	Channel A Preamp.	ECC83/12AX7(7025)*
V2	Channel A AF Amp. - Channel B AF Amp.	ECC81/12AT7
V3	Channel A AF Amp. - Cathode Follower	ECC81/12AT7
V4	Channel A AF Amp. - Channel B AF Amp.	ECC83/12AX7(7025) *
V5	Channel A AF Amp. - Channel A Phase Inv.	7247
V6	Channel A Output	7189
V7	Channel A Output	7189
V8	Channel B Preamp.	ECC83/12AX7 (7025) *
V9	Channel B AF Amp. - Cathode Follower	ECC81/12AT7
V10	Channel B AF Amp. - Channel B Phase Inv.	7247
V11	Channel B Output	7189
V12	Channel B Output	7189
V13	Rectifier	GZ34/5AR4

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA FISHER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450	C50180-10	AFH4-18-10	D0171	FP446	TMQ-4640	TVL-4771.8	
B	■10	450							
C	▲10	450							
D	40	450							
C2A	▲40	450	C50180-9	AFH4-15-10	D0179.7	FP444.5	TMQ-4637	TVL-4771.6	
B	■20	450							
C	▲20	450							
D	10	450							
C3	20	250	C746-145	PRS1570	BR2025	TC55	TD-20-250	TVA-1508	①
C4A	▲1000	30	C50180-7					TVLS-2243 *	
B	▲1000	30							
C5	8	50	C629-138	PTT-50008	NLW8-100	TT150X8	MLV10-50	TE-1303.3	
C6	8	50	C629-138	PTT-50008	NLW8-100	TT150X8	MLV10-50	TE-1303.3	
C7	25	6	C639-114	PTT-6025	NLW25-6	TT6X25	ML25-6	TE-1091	
C8	25	6	C639-114	PTT-6025	NLW25-6	TT6X25	ML25-6	TE-1091	
C9	25	6	C639-114	PTT-6025	NLW25-6	TT6X25	ML25-6	TE-1091	
C10	25	6	C639-114	PTT-6025	NLW25-6	TT6X25	ML25-6	TE-1091	

① Not used in some versions.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C11	180 10%		DI-180	DD-181	L10T18	CCD-181	GP318	10TS-T18
C12	390 10%		DI-390	DD-391	L10T39	CCD-391	GP339	10TS-T39
C13	1200 10%		DI-1200	DD-122	5R5D12	CCD-122	GP212	10TS-D12
C14	560 10%		DI-560	DD-561	5R5T56	CCD-561	GP356	10TS-T56
C15	100 N1500	#C50070-6		TCL-100		*		
C16	390 10%		DI-390	DD-391	L10T39	CCD-391	GP339	10TS-T39
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C18	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C19	15 N75 10%	#C50070-18				*		
C20	1000 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C21	20000		DI-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C22	3300 10%		DI-3300		PM6D33	CCD-332	JL-233	10TS-D33
C23	24 N150 5%	#C50070-8				*		
C24	1000 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C25	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C26	.68 250V		P484CM-68		DPMS4P68		GEM-6068	
C27	.047 250V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C28	330 10%		DI-330	DD-330	L10T33	CCD-331	GP333	10TS-T33
C29	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C30	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C31	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C32	20000	Note 1	BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C33	47 N750 10%	(30-N150) †	N750-DI 47	DTN-470	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C34	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C35	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C36	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C37	820 10%		DI-820	DD-821	5R5T82	CCD-821	GP382	10TS-T82
C38	180 10%		DI-180	DD-181	L10T18	CCD-181	GP318	10TS-T18
C39	390 10%		DI-390	DD-391	L10T39	CCD-391	GP339	10TS-T39
C40	390 10%		DI-390	DD-391	L10T39	CCD-391	GP339	10TS-T39
C41	100 N1500			TCL-100		*		
C42	560 10%		DI-560	DD-561	5R5T56	CCD-561	GP356	10TS-T56
C43	1200 10%		DI-1200	DD-122	5R5D12	CCD-122	GP212	10TS-D12
C44	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C45	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C46	15 N75 10%	#C50070-18				*		
C47	1000 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C48	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C49	3300 10%		DI-3300		PM6D33	CCD-332	JL-233	10TS-D33
C50	30 N150 10%	#C50070-3				*		10TCP-Q33
C51	1000 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C52	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C53	.68 250V		P484CM-68		DPMS4P68		GEM-6068	
C54	.047 250V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C55	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C56	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C57	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C58	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C59	20000	Note 1	BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C60	47 N750 10%	(30-N150) †	N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C61	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C62	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C63	15 N75 10%	#C50070-18				*		
C64	820 10%		DI-820	DD-821	5R5T82	CCD-820	GP382	10TS-T82
C65	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C66	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50

Note 1. Not used in some versions.
† Alternate Value.
# Fisher Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	FISHER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	Switch		R740-128					Loudness-Contour
B	100K *							Volume, Channel B
C	100K *							Volume, Channel A
D	Switch							Power Off-On
R2A	500K		R50160-39	F3-42 ♦				Treble, Channel B
	250K Tap							
B	500K			R4-42				Treble, Channel A
	250K Tap							
R3A	1meg †		R50160-25	F1-56 ♦				Bass, Channel B
B	1meg †			R2-56				Bass, Channel A
R4A	100Ω		R50160-36	B-5	A47-1000-S	Q11-108	U-4	Center Channel
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	500K		R50160-37				FA55T15	Balance, Channel A
	100K Tap							
B	500K						RU55T35	Balance, Channel B
	400K Tap							
C	Shaft						CS3500	
R6	1meg		R50160-38					Stereo Dimension
R7A	50K		R50103-3	BX-31	A47-50K-S	Q11-123	SU-35	Phase Inverter, Channel B
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R8A	50K		R50103-3	BX-31	A47-50K-S	Q11-123	SU-35	Phase Inverter, Channel A
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R9A	5000Ω		R50103-4	BX-10	A47-5000-S	Q11-114	U-14	Bias, Channel B
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R10A	5000Ω		R50103-4	BX-10	A47-5000-S	Q11-114	U-14	Bias, Channel A
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R11A	25K		R50103-2	AB-26	A47-25K-S	Q11-120	SU-29	DC Balance, Channel B
B	Shaft			AK-1	FKS-1/4	Not Req.	Not Req.	
R12A	25K		R50103-2	AB-26	A47-25K-S	Q11-120	SU-29	DC Balance, Channel A
B	Shaft			AK-1	FKS-1/4	Not Req.	Not Req.	
R13	250K	.2	R50160-11	JP-254			MLC254L	Phono Level, Channel B
R14	250K	.2	R50160-11	JP-254			MLC254L	Tape Level, Channel B
R15	250K	.2	R50160-11	JP-254			MLC254L	Phono, Level, Channel A
R16	250K	.2	R50160-11	JP-254			MLC254L	Tape Level, Channel A

* Taps ③ 40K and 60K.
† 500K Tap Not used.
♦ Use AK-32 Friction Spring.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R17	100K				R38	2.7meg			
R18	10K				R39	10meg			
R19	100K				R40	2.2meg			
R20	330K 1W				R41	220K			
R21	2700Ω 1W				R42	2700Ω			
R22	15Ω				R43	1meg			
R23	120K				R44	18K 1W			
R24	10meg				R45	270Ω			
R25	1.5meg				R46	10K			
R26	270K				R47	22K			
R27	4.7meg				R48	100K 1W			
R28	220K				R49	2200Ω			
R29	470K				R50	47K			
R30	1.8meg				R51	820K			
R31	47K 1W				R52	470K			
R32	470Ω				R53	3900Ω			(5600Ω) *
R33	330K				R54	220Ω			
R34	330K				R55	2.2meg			(68K) *
R35	56K				R56	1.5meg			
R36	2.2meg				R57	8200Ω			(39K) *
R37	560K				R58	2200Ω			

RESISTORS (cont)

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R59	220K				R101	2200Ω			
R60	47K				R102	47K			
R61	10Ω 2W				R103	820K			
R62	2200Ω				R104	470K			(680K) *
R63	220K				R105	3900Ω			(5600Ω) *
R64	47K				R106	220Ω			
R65	3900Ω				R107	2.2meg			(68K) *
R66	5600Ω				R108	1.5meg			
R67	.47Ω 5W		T47		R109	8200Ω			(39K) *
R68	100K				R110	18K			(68K) *
R69	10K				R111	2200Ω			
R70	100K				R112	220K			
R71	330K 1W				R113	47K			
R72	2700Ω 1W				R114	10Ω 2W			
R73	15Ω				R115	2200Ω			
R74	10meg				R116	220K			
R75	120K				R117	47K			
R76	1.5meg				R118	3900Ω			
R77	270K				R119	5600Ω			
R78	4.7meg				R120	0.47Ω 5W		T47	
R79	220K				R121	27K			
R80	470K				R122	4700Ω			
R81	1.8meg				R123	2200Ω 5W	PW5-2200	10W-2200	
R82	2.2meg				R124	2200Ω 5W	PW5-2200	10W-2200	
R83	47K 1W				R125	7500Ω 7W	PW10-7500	10W-7500	
R84	470Ω				R126	7500Ω 7W	PW10-7500	10W-7500	
R85	330K				R127	4000Ω 5W	PW5-4000	5W-SQ-4000	
R86	330K				R128	7500Ω 7W	PW10-7500	10W-7500	
R87	56K				R129	4000Ω 5W	PW5-4000	5W-SQ-4000	
R88	2.2meg				R130	250Ω 7W	PW10-250	10W-250	
R89	560K				R131	250Ω 7W	PW10-250	10W-250	
R90	10meg				R132	4700Ω			
R91	2.7meg				R133	4700Ω			
R92	2.2meg				R134	15Ω 5W	PW5-15	5W-SQ-15	
R93	220K				R135	220Ω			
R94	2700Ω				R136	220Ω			
R95	1meg				R137	47Ω			
R96	18K 1W				R138	2.2meg			
R97	270Ω				R139	18K			(68K) *
R98	10K				R140	2200Ω 1W			
R99	22K				R141	7500Ω 7W			
R100	100K 1W								

* Alternate Value.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	FISHER PART No.	REPLACEMENT DATA
K1	Scratch Filter	100mmf, 100mmf, 220mmf, 100K, 100K	PC50187-2	
K2	Tone Comp.	330mmf, 4700mmf, 4700mmf, 1000Ω, 100K, 100K, 120K	PC657-140A	
K3	Scratch Filter	100mmf, 100mmf, 220mmf, 100K, 100K	PC50187-2	
K4	Tone Comp.	330mmf, 4700mmf, 4700mmf, 1000Ω, 100K, 100K, 120K	PC657-140A	

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	FISHER PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V @ @ 1.5A	740 VCT @ .200A DC	5V @ 1.9A	T740-115					
	SEC. 3	SEC. 4	SEC. 5						
	6.3V @ 3.8A	24V @ .650A							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	FISHER PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	8000Ω CT	16Ω Tap @ 8Ω, 4Ω	T740-116A ①					① Alternate Part #T740-116
T3	8000Ω CT	16Ω Tap @ 8Ω, 4Ω	T740-116A ①					

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	FISHER PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	420A	SR740-137 *				* Bridge Type Selenium

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			FISHER PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	3.2A 125V S/B	F3319	X1036	3I303.2 (3AG 3 2/10A 125V S/B)	342001	MDX 3 2/10	HKP

MISCELLANEOUS

ITEM No.	PART NAME	FISHER PART No.	NOTES
M3	Switch	S740-130	Selector (Rotary Wafer Type)
M4	Switch	S740-129	Mono-Stereo (Rotary Wafer Type)
M5	Switch	S50200-2	Rumble Filter (DPDT, Slide Type)
M6	Switch	S50200-2	Tape-Monitor Off-On (DPDT, Slide Type)
M7	Switch	S50200-2	Scratch Filter (DPDT, Slide Type)
M8	Switch	S50200-2	Phase, Reverse-Normal (DPDT, Slide Type)
M9	Switch	S50200-2	Center Channel Off-On (DPDT, Slide Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

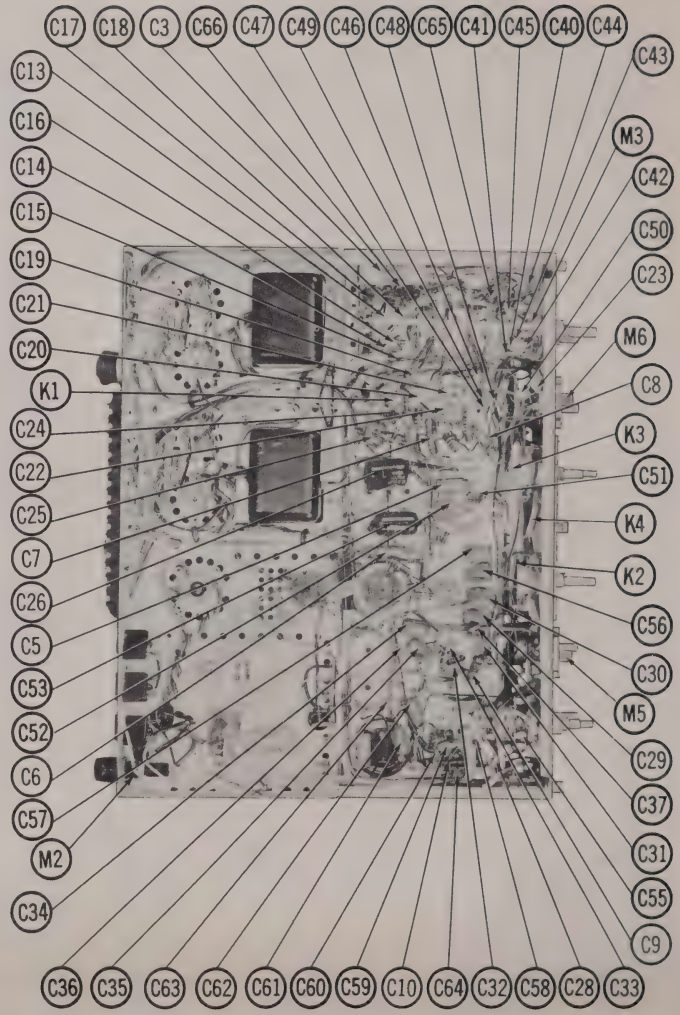
NAME	PART NO.	DESCRIPTION
Knob	E50133-2	Center Channel, Dimension, Balance, Mono-Stereo
Knob	E50154-1	Selector
Knob	E50153-1	Rear; Loudness, Bass, Treble
Knob	E50152	Front; Loudness, Bass, Treble

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS—BOTTOM VIEW



PHOTOFACT® Folder

HARMAN-KARDON
MODEL T220 (The Aria)

HARMAN-KARDON
MODEL T220 (The Aria)

HARMAN-KARDON
MODEL T220 (The Aria)

TRADE NAME	Harman-Kardon Model T220 (The Aria)		
MANUFACTURER	Harman-Kardon, Inc., 520 Main Street, Westbury, L. I., N. Y.		
TYPE SET	AC Operated 7 Tube FM-AM Tuner		
POWER SUPPLY	105 – 125 Volts AC, 60 Cycles	RATING	44 Watts, .42 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	540 – 1600KC	FREQ. MOD.	88 – 108MC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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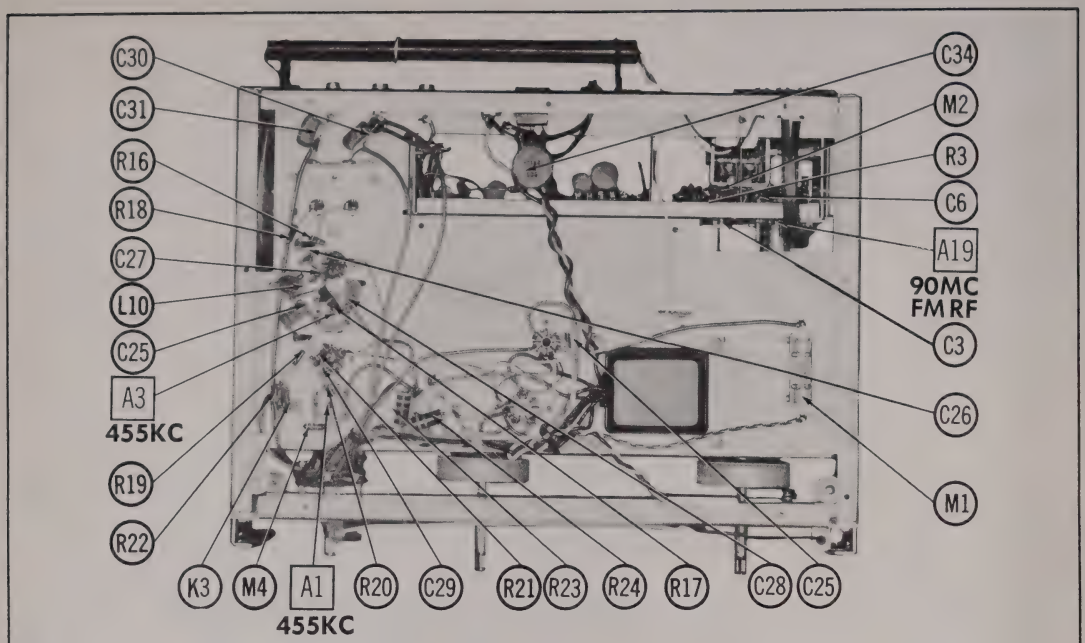
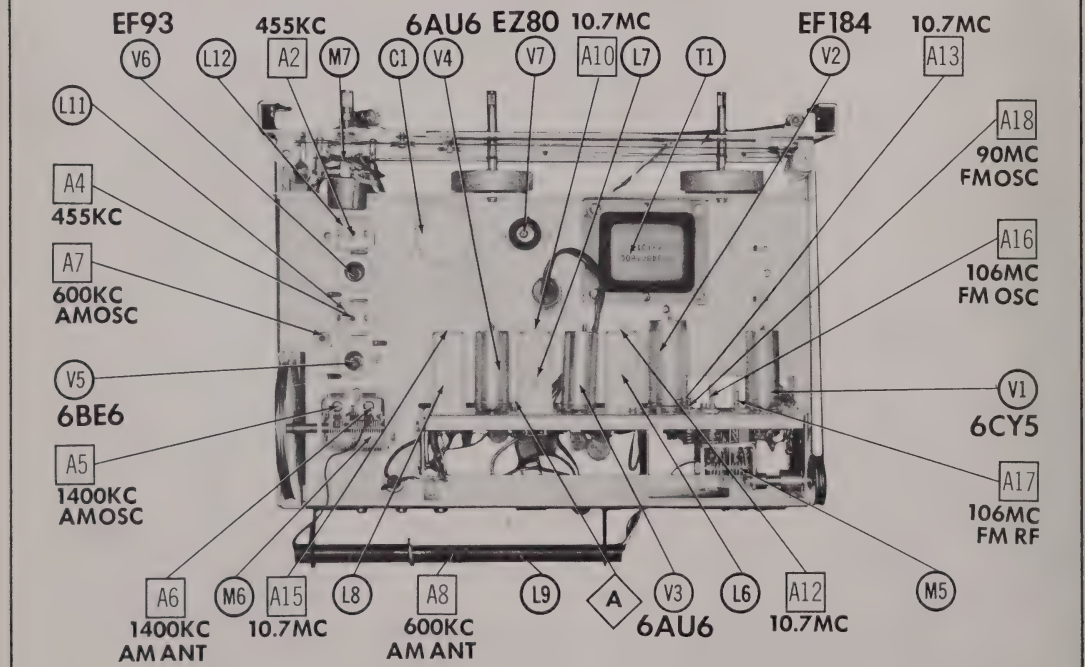
KL345

SET 526 FOLDER 5



CHASSIS-BOTTOM VIEW



CHASSIS-TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.

Suggested Alignment Tools:
A1 Thru A4, A7, A9 Thru A15. . . GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6. . . . . GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A16, A17, A18, A19. . . . . GENERAL CEMENT #8721, 8722
WALSCO #2519

AM ALIGNMENT — SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400~ Mod.)	(AM) Tuning gang fully open.	AC probe across AM Output jack.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	Across AM antenna terminals.	1400KC	1400KC	"	A5, A6	"
3.	"	600KC	600KC	"	A7, A8	Adjust for maximum deflection. Repeat Step 2 and 3.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side to ungrounded tube shield floating over FM RF Amp. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A9, A10, A11, A12 A13	Adjust for maximum deflection.
5.	"	"	"	DC probe thru 1meg to point Ⓑ. Common to chassis.	A14	"
6.	"	"	"	DC probe to point Ⓒ. Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	High side to ungrounded tube shield floating over FM RF Amp. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point Ⓐ. Low side to chassis.	A9, A10, A11, A12, A13	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
5.	"	"	"	Vert. amp. thru 47K to point Ⓑ. Low side to chassis.	A14	"
6.	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A15	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A14 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	Across FM antenna terminals.	106MC (Unmod.)	(FM) 106MC	DC probe to point Ⓐ. Common to chassis.	A16, A17	Adjust for maximum deflection.
8.	"	90MC	90MC	"	A18, A19	"

FIG. 1

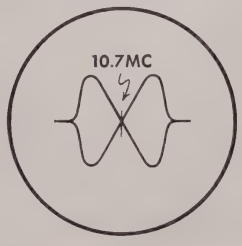
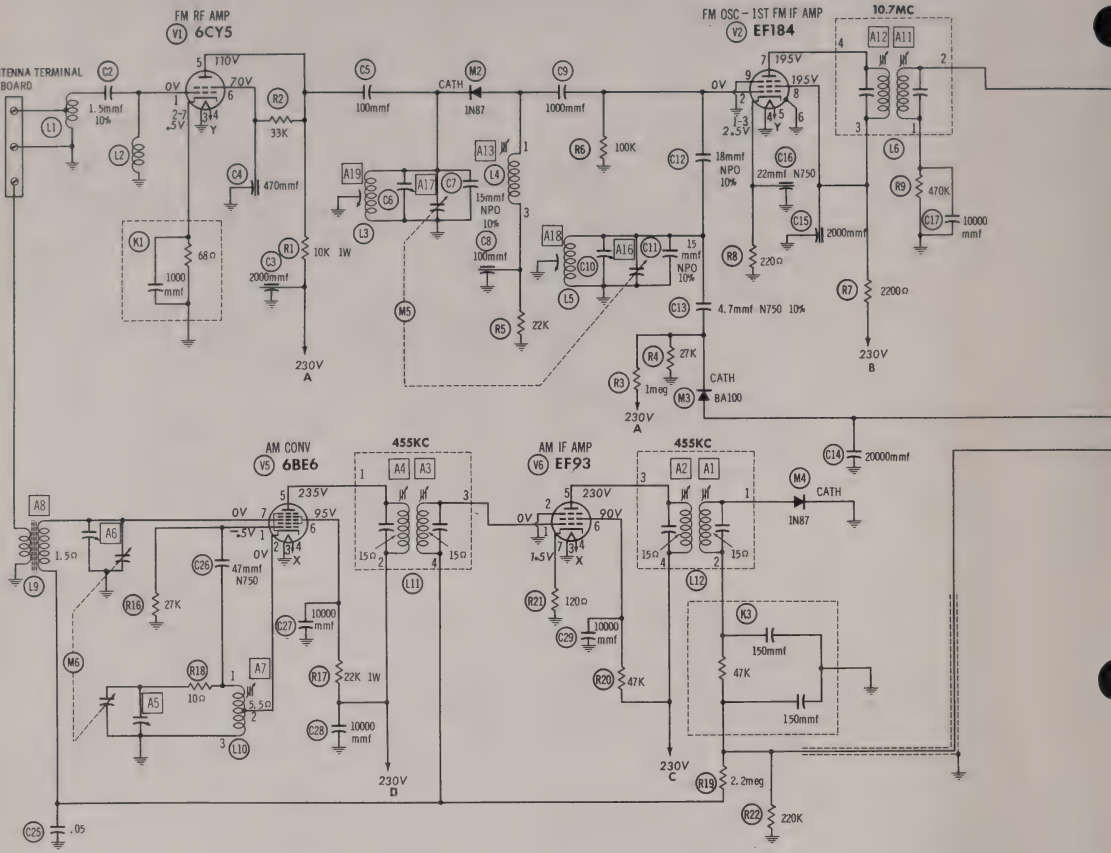


FIG. 2



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CY5	0Ω	68Ω	0Ω	.1Ω	†10K	†43K	68Ω		
V2	EF184	220Ω	100K	220Ω	0Ω	.1Ω	0Ω	†2800Ω	†2800Ω	0Ω
V3	6AU6	470K	0Ω	0Ω	.1Ω	†1000Ω	†28K	0Ω		
V4	6AU6	100K	0Ω	0Ω	.1Ω	†47K	†95K	0Ω		
V5	6BE6	27K	0Ω	0Ω	.1Ω	†660Ω	†22K	2.4meg		
V6	EF93 6BA6	2.4meg	0Ω	0Ω	.1Ω	†660Ω	†47K	120Ω		
V7	EZ80 6V4	210Ω	NC	¶	.1Ω	0Ω	NC	195Ω	NC	NC

ALL MEASUREMENTS MADE IN "AM-FM" POSITION.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V7. NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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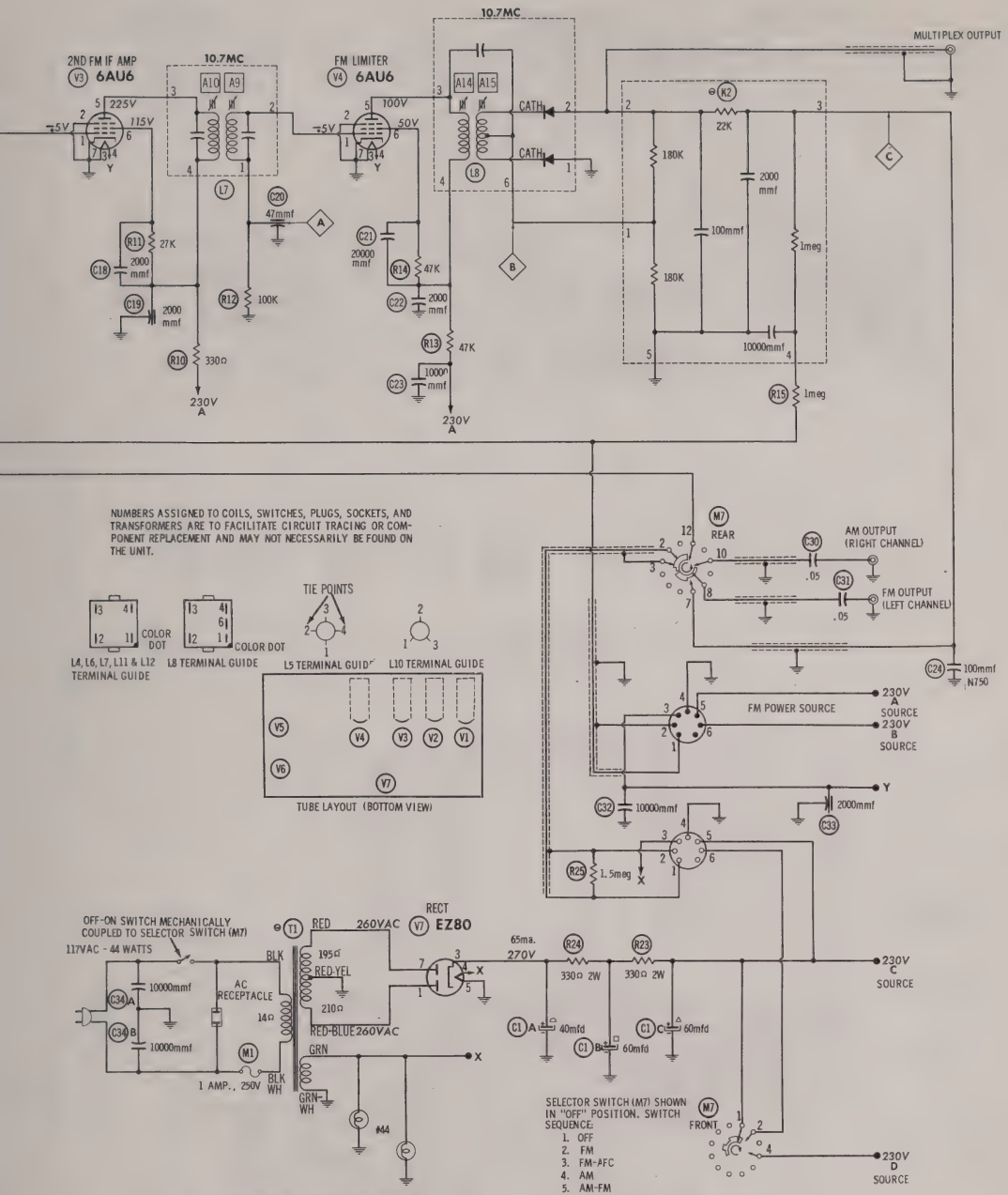


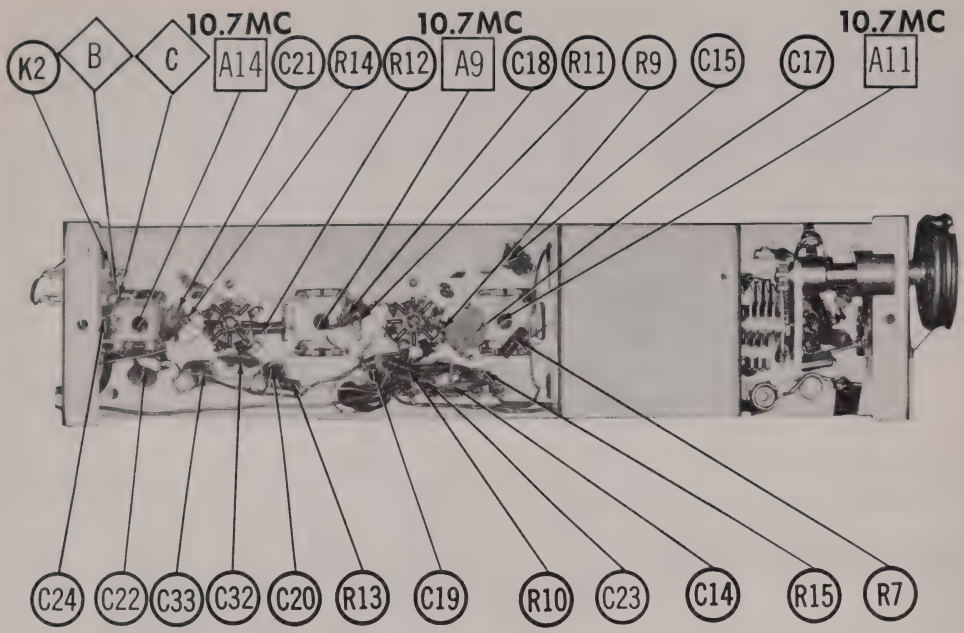
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

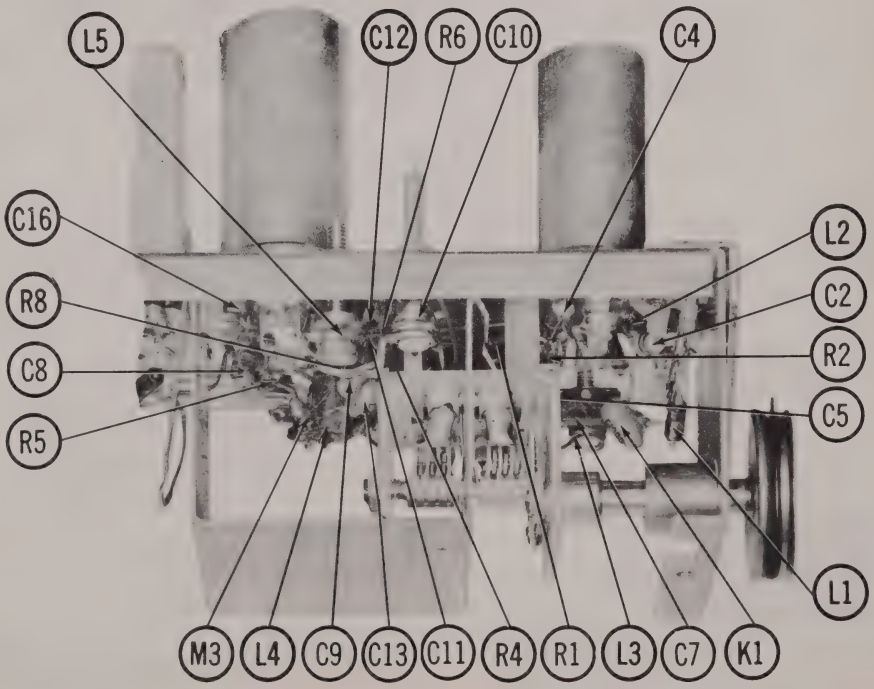
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

HARMAN-KARDON
MODEL T220 (The Aria)



FM CHASSIS



FM RF SUBCHASSIS

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
	• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •				
V1	FM RF Amplifier	6CY5	V5	AM Converter	6BE6
V2	FM Osc. -1st FM IF Amp.	EF184	V6	AM IF Amplifier	EF93/6BA6
V3	2nd FM IF Amplifier	6AU6	V7	Rectifier	EZ80/6V4
V4	FM Limiter	6AU6			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Harman-Kardon PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	350	JE3484159		B0260		TMD-2320	TVL-2579	
B	■60	300			BR4035		TD-40-350	TVA-1611	
C	▲60	300							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	1.5 10%		NPO-SI 1.5	TCZ-1R5	C10V15C		CNO-515	10TCC-V15
C3	2000							
C4	470							
C5	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C6								
C7	15 NPO 10%		1469-000015	TCZ-15	22R5Q15	CM-19B-150K	CNO-415	MS-415
C8	100		EF-0001	MFT-100				
C9	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C10								
C11	15 NPO 10%		1469-000015	TCZ-15	22R5Q15	CM-19B-150K	CNO-415	MS-415
C12	18 NPO 10%		1469-000018	TCZ-18	22R5Q18	CM-19B-180K	CNO-418	MS-418
C13	4.7 N750 10%			DTN-5	C10V5C	CCTN-050	CN7-547	10TCU-V50
C14	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C15	2000							
C16	22 N750							
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C18	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C19	2000							
C20	47							
C21	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C22	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C23	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C24	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C25	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C26	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C27	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C28	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C29	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C30	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C31	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C32	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C33	2000							
C34A	10000		BPD-2X01	DD3-103	BYD6DS1	CCD-103	UAC-2X110	5HK-2S10
B	10000					CCD-103		

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R1	10K 1W			
R2	33K			
R3	1meg			
R4	27K			
R5	22K			
R6	100K			
R7	2200Ω			
R8	220Ω			
R9	470K			
R10	330Ω			
R11	27K			
R12	100K			
R13	47K			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R14	47K			
R15	1meg			
R16	27K			
R17	22K 1W			
R18	10Ω			
R19	2.2meg			
R20	47K			
R21	120Ω			
R22	220K			
R23	330Ω 2W			
R24	330Ω 2W			
R25	1.5meg			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Harman-Kardon PART No.	REPLACEMENT DATA
K1	FM RF Cathode Bias	1000mmf, 68Ω	STCOM4018	
K2	Discriminator Network	100mmf, 2000pmf, 10000mmf, 22K, 180K, 180K, 1meg	PCCOM3081A ①	Sprague C-8
K3	AM Diode RF Filter	150mmf, 150mmf, 47K	PC781599	Aerovox PA-98 Centralab PC-51 Cornell-Dubilier 111TM2 Sprague D-2

① Some versions may use Part #GT3414013.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Harman-Kardon PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	NOTES
L1	FM Ant.	GLCOM3082				
L2	RF Choke	GLCOM3083				
L3	FM RF	GL3414014				
L4	1st FM IF	GL3414010				
L5	FM Osc.	GL3414015				▲ Connect 2 Crystals Externally
L6	2nd FM IF	GT3414011	FM-254	1463	RTC-8599	
L7	3rd FM IF	GT3414012	FM-254	1463	RTC-8599	
L8	Discriminator	GT3414013	FM-253▲	1464▲	RTC-8665▲	
L9	Loopstick	GL3484028	BC-418	705-A		
L10	AM Osc.	GL3484026	BC-393	70-OSC	RTC-8647	
L11	1st AM IF	GTCOM4152	BC-352	12-C1	RTC-8632	
L12	2nd AM IF	GTCOM4153	BC-353	12-C2	RTC-8633	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Harman-Kardon PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V ② .42A	520VCT ② .065A DC	6.3V ② 2.8A	FT3484160C ①	P-3048	PM8419		R-10B ②	① Alternate Part # FT3484160 ② Tape 5V and Center Tap on 6.3V Windings

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Harman-Kardon PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	1A 250V		P1142116	312001 (3AG 1A 250V)	357001	AGC 1	4405

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Harman-Kardon PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N87			1N87	1N87	Mixer Diode
M3	BA100					AFC Diode
M4	1N87			1N87	1N87	AM Detector

MISCELLANEOUS

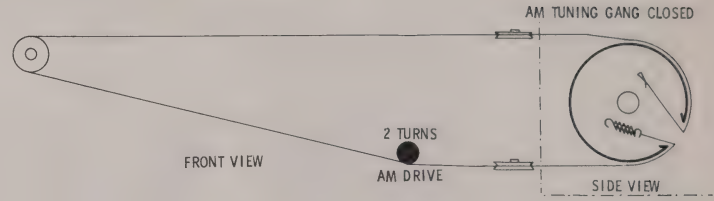
ITEM No.	PART NAME	Harman-Kardon PART No.	NOTES
M5	Tuning Cap.	JV3413983	FM, 2 Gang
M6	Tuning Cap.	JVCOM4041	AM, 2 Gang (Ant. 25—394mmf, Osc. 26—139mmf)
M7	Switch	ER3484161	Function Selector (Rotary Wafer Type)

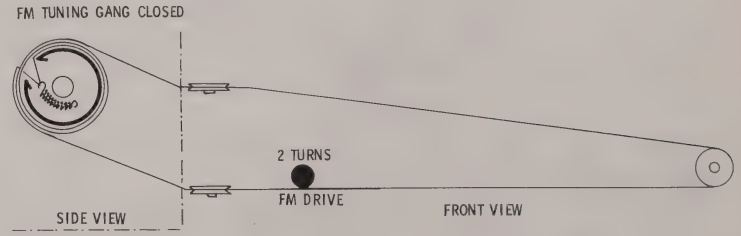
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Glass	P348061	
Knob	PCOM3468	

TUNING DRIVE CORD STRINGING





PHOTOFACT® Folder

RADSON MODELS
RT-70A, RT-75A, RP-115, RP-612

RADSON MODELS
RT-70A, RT-75A, RP-115, RP-612

RADSON MODELS
RT-70A, RT-75A, RP-115, RP-612

TRADE NAME	Radson Models RT-70A, RT-75A, RP-115, RP-612
MANUFACTURER	Radson Engineering Corp. , Macon, Illinois
TYPE SET	Seven Tube Crystal Controlled 2 Channel Citizens Band Transmitter-Receiver
POWER SUPPLY	Models RT-70A, RP-115: 110-120 Volts AC, 60 Cycles Models RT-75A, RP-612: 6 (or) 12 Volt Storage Battery
RATING	35 Watts, .38 Amp. @117 Volts AC (Receive) ; 46 Watts, .5 Amp. @117 Volts AC (Transmit) (or) 6 Amp. @6.3 Volts DC (Receive); 8 Amp. @6.3 Volts DC (Transmit) (or) 3 Amp. @12.6 Volts DC (Receive); 4 Amp. @12.6 Volts DC (Transmit)
TUNING RANGE	Any 2 of Citizens Band Channels 1 thru 22

NOTICE

ONLY THOSE PERSONS PROPERLY LICENSED BY FCC ARE PERMITTED TO EFFECT REPAIRS OR MAKE CRYSTAL SUBSTITUTION ON THIS TYPE EQUIPMENT.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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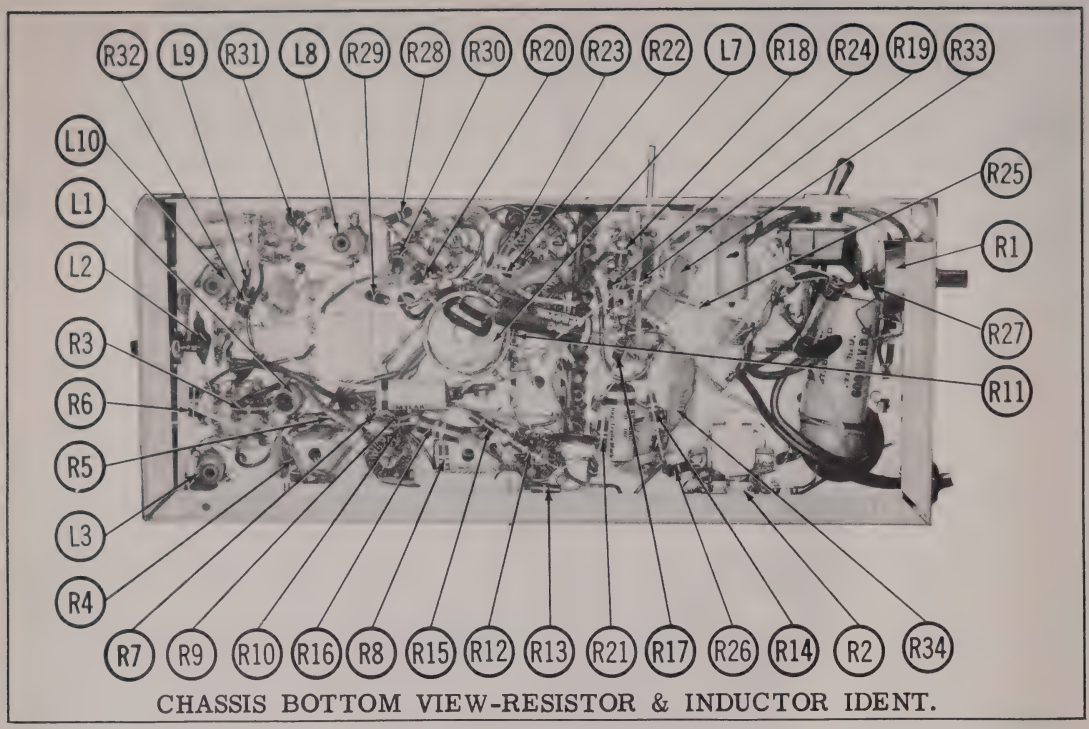
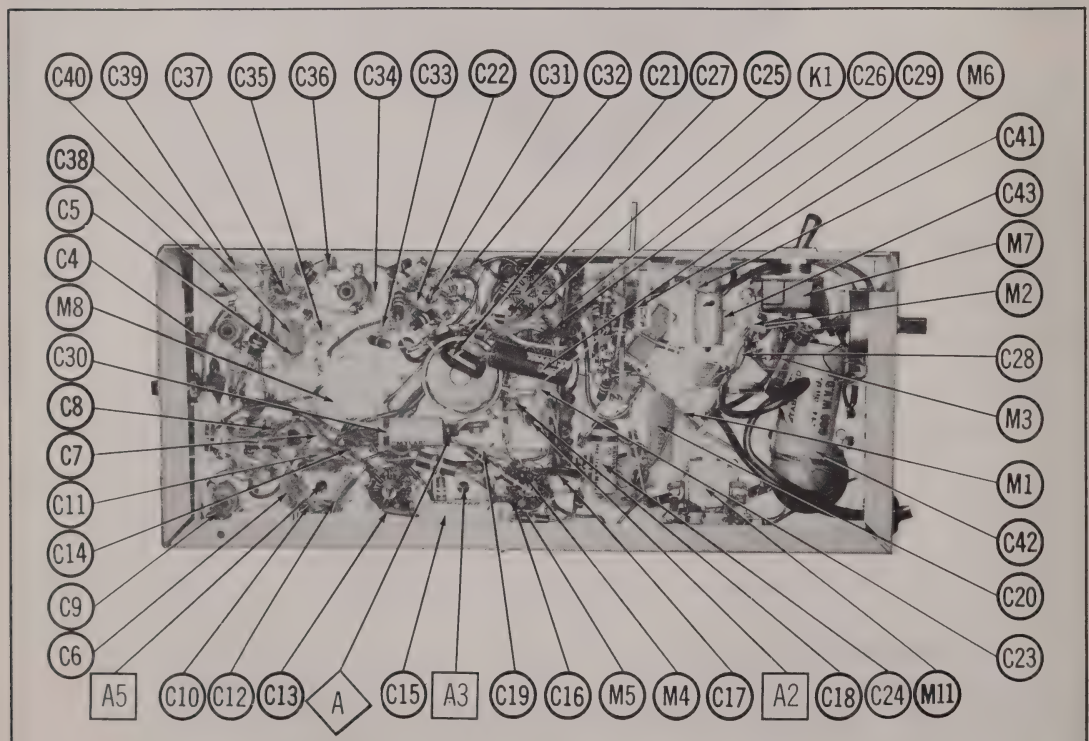
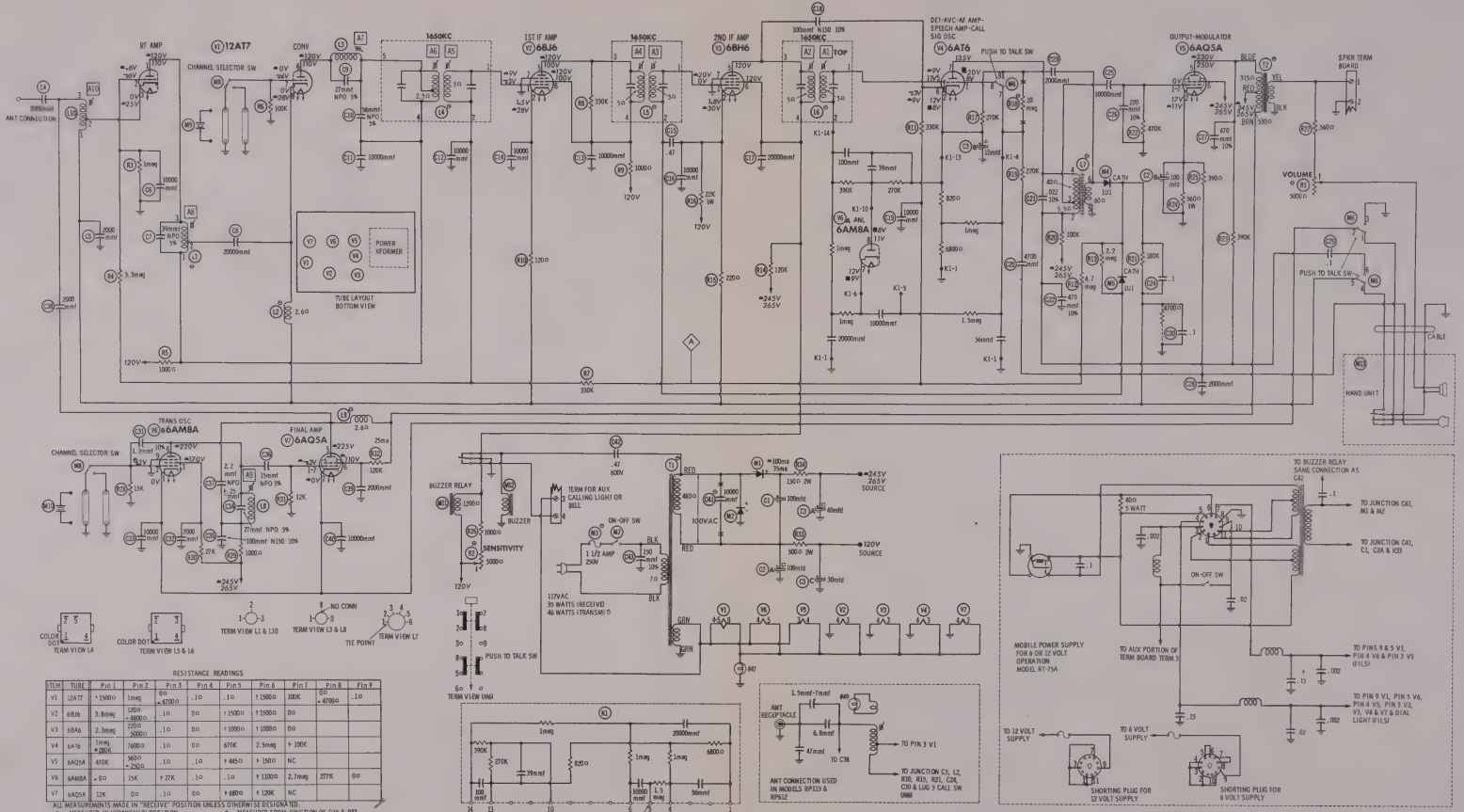
SET 526 FOLDER 6



CHASSIS BOTTOM VIEW-RESISTOR & INDUCTOR IDENT.



CHASSIS BOTTOM VIEW-ALIGNMENT, CAPACITOR & MISC. IDENT.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AT7	*1500Ω	1meg	0Ω *4700Ω	.1Ω	.1Ω	†1500Ω	100K	0Ω *4700Ω	.1Ω
V2	6BJ6	3.8meg	120Ω *6800Ω	.1Ω	0Ω	†150Ω	†150Ω	0Ω		
V3	6BA6	2.3meg	220Ω 5000Ω	.1Ω	0Ω	†1000Ω	†1000Ω	0Ω		
V4	6A16	1meg *280K	760Ω	.1Ω	0Ω	670K	2.5meg	†100K		
V5	6AQ5A	470K	560Ω *250Ω	.1Ω	.1Ω	†445Ω	†150Ω	NC		
V6	6AM8A	∞0Ω	†27K	.1Ω	.1Ω	†1100Ω	2.7meg	277K	0Ω	
V7	6AQ5A	12K	0Ω	.1Ω	0Ω	†680Ω	†120K	NC		

ALL MEASUREMENTS MADE IN "RECEIVE" POSITION UNLESS OTHERWISE DESIGNATED.
* MEASURED IN "TRANSMIT" POSITION.
■ MEASURED IN "CALL" POSITION.
NC NO CONNECTION
† MEASURED FROM JUNCTION OF C2A & R33.
† MEASURED FROM OUTPUT OF M1.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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RADSON MODELS
RT-70A, RT-75A, RP-115, RP-612

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •)
V1	RF Amp. - Conv.	12AT7
V2	1st IF Amplifier	6BJ6
V3	2nd IF Amplifier	6BH6
V4	Det. -AVC-AF Amp. - Speech Amp. -Call. Sig. Osc.	6AT6
V5	Output-Modulator	6AQ5A
V6	ANL - Trans. Osc.	6AM8A
V7	Final Amplifier	6AQ5A

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA RADSON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	100	150	10-452-2	AFH1-21	XA0241	FP116	TMS-1240	TVL-1423	
C2A	▪100	150	10-452-3	AFH2-24-21	XA0241	FP116	TMD-2145	TVL-1423	
B	▲100	25			BBR100-25	TC2501		TVA-1207	
C3A	▪40	300	10-452-1	AFH3-28-30	B0410	FP230. 3	TMD-2475	TVL-2757	
B	▲10	300			BR4035	TC47	TD-40-350	TVA-1611	
C	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C5	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	39 NPO 5%			TCZ-39	C10Q39C		CNO-439	10TCC-Q39
C8	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C9	27 NPO 5%			TCZ-27	C10Q27C		CNO-427	10TCC-Q27
C10	56 NPO 5%			TCZ-56	C10Q56C		CNO-456	10TCC-Q56
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C15	.47 100V		P488N-47		CUB2P47	IDP-4-474	GEM-2047	2TM-P47
C16	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C17	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C18	100 N150 10%					*		10TCP-T10
C19	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C20	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C21	.022 100V 10%		V84C2S22-10%		PM4S22	IDP-2-223		4TM-S22
C22	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C23	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C24	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C25	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C26	220 10%		DI-220	DD-221	LI0T22	CCD-221	GP322	10TS-T22
C27	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C28	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C29	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C30	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C31	1.2 10%		NPO-SI 1.5	DTZ-1R5	C10V15C		CNO-515	10TCC-V12
C32	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C33	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C34	27 NPO 5%			TCZ-27	C10Q27C		CNO-427	10TCC-Q27
C35	100 NI50 10%					*		10TCP-T10
C36	15 NPO 5%			DTZ-15	C10Q15C		CNO-415	10TCC-Q15
C37	2.2 NPO ± .25mmf		NPO-DI 2.2	DTZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C38	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C39	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C40	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C41	10000	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C42	.47 600V		P688N-47		WMF6P47E	6DP-6-474	GEM-6047	6TM-P47
C43	150 10%		DI-150	DD-151	LI0T15	CCD-151	GP315	10TS-T15

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RADSON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	5000Ω	½	10-487-2①	B-12		Q17-114		Volume Sensitivity
R2	5000Ω	½	10-487-3②					

① Some versions may use Part #10-487-1.
② Some versions may use Part #10-697-1.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R3	1meg			
R4	3.3meg			
R5	1000Ω			
R6	100K			
R7	330K			
R8	330K			
R9	1000Ω			
R10	120Ω			
R11	330K			
R12	4.7meg			
R13	2.2meg			
R14	120K			
R15	220Ω			
R16	22K 1W			
R17	270K			
R18	10meg			Note 1

Note 1. Not used in some versions.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R19	220K			
R20	100K			
R21	180K			
R22	470K			
R23	390K			
R24	560Ω 1W			
R25	390Ω			
R26	1000Ω			
R27	560Ω			
R28	15K			
R29	1000Ω			
R30	27K			
R31	12K			
R32	120K			
R33	500Ω 2W			
R34	150Ω 2W			

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	RADSON PART No.	REPLACEMENT DATA
K1	Audio Network	39mmf, 56mmf, 100mmf, 10000mmf, 20000mmf, 820Ω, 6800Ω, 270K, 390K, 1meg, 1meg, 1meg, 1.5meg	10-622-1	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		RADSON PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1	RF	10-460-2				①Alternate Part #10-022-3 (18uh)
L2	RF Choke(36uh)	10-629-1 ①	TV-180	6176	RTC-8598	② Alternate Part #20-110-2
L3	Conv. Plate	10-460-1	TV-118	6171-A	RTC-8609	③ Alternate Part #20-110-1
L4	1st IF	20-110-4 ②				④Part #10-462-1, 10-631-2 or 10-631-1
L5	2nd IF	20-110-3 ③		13-W1	RTC-8686	(With C21) may be used.
L6	3rd IF	20-110-3 ③		13-W1	RTC-8686	⑤ Alternate Part#10-022-1 (250uh)
L7	Call Signal Osc.					
L8	Osc. Plate	10-460-1	TV-118	6171-A	RTC-8609	
L9	RF Choke (36uh)	10-629-1 ⑤	TV-180	6176	RTC-8598	
L10	Ant.	10-460-2				

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	RADSON PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V @ .5A	100V @ .300A AC	12.6V @ 1.3A	B-20-104 ①					① Alternate Part # 20-104-1, Part #20-111-1 used in Battery Operated Models.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	RADSON PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	11.6K CT	3-4Ω	A-10-463①	A-2936②		22887		①Alternate Part #10-463-1. ② Use Original Frame.

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	RADSON PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.100A	10-526-1	1N1763	2F4	SR200	Silicon Type
M2	.100A	10-526-1	1N1763	2F4	SR200	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			RADSON PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	3AG	1½A 250V P/T	10-736-2 (Note 1)		31801.5 (1½A 250V P/T) 3AG		GJV 1½	

Note 1, 6 volt versions use 14 Amp. and 12 volt versions use 6 Amp. fuse.

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		RADSON PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M4	1U1	10-527-1 ♦				♦ Selenium
M5	1U1	10-527-1 ♦				

MISCELLANEOUS

ITEM No.	PART NAME	RADSON PART No.	NOTES
M6	Switch	10-467-1	Push-To-Call (Pushbutton Type, Spring Loaded)
M7	Switch	10-062-1	Power Off-On (Toggle Type)
M8	Switch		Channel Selector (Pushbutton Type)
M9	Crystal		Receive (Order by Channel Desired)
M10	Crystal		Transmit (Order by Channel Desired)
M11	Relay	10-628-1	Buzzer Control
M12	Buzzer	10-633-1 (or) 10-512-1	
M13	Hand Set	20-121-1	Includes Push-To-Talk Switch

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

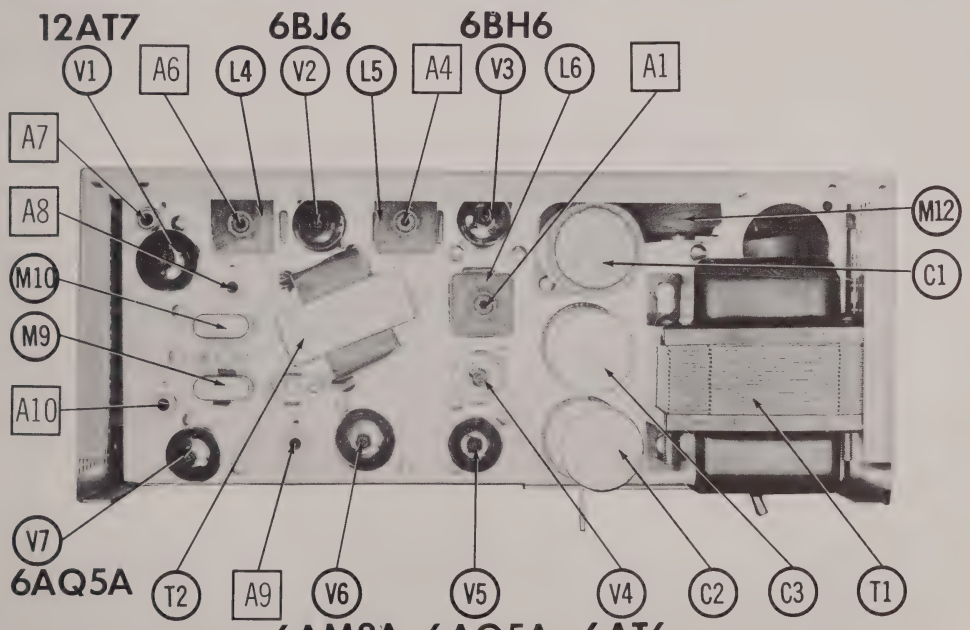
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested Alignment Tools: A1 Thru A10....GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

RECEIVER ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side to antenna terminal. Low side to chassis.	1650KC (400~ 30% Mod.)	Not Used	DC probe to point (A). Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"		"	A2, A3, A4, A5, A6	Adjust for maximum deflection.
3.	High side thru termination to antenna.	Receiver Frequency		"	A7	Turn clockwise until oscillator ceases, then counterclockwise until oscillation just starts. This should be within 1 turn of maximum AVC voltage as indicated on VTVM.
4.	"	"		"	A8	Adjust for maximum deflection (Use position farthest in which produces maximum).

TRANSMITTER ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	Connect a dummy load to the antenna terminal.	Not Used	Not Used	DC probe thru 100K to pin 1 (grid) of Final. Common to chassis.	A9	Adjust for -20 volts.
6.	Connect whip antenna.			Use field strength meter.	A10	Adjust for maximum output. Check transmitter frequency with Frequency meter or crystal calibrated receiver.



CHASSIS—TOP VIEW

PHOTOFACT® Folder

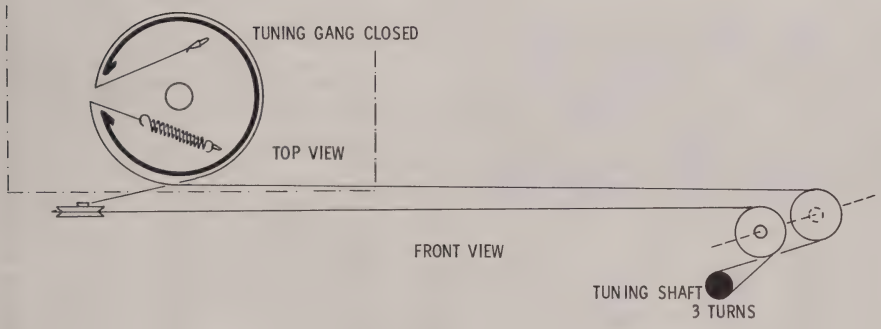
RAULAND MODEL HF100

RAULAND
MODEL HF100

RAULAND
MODEL HF100

TRADE NAME	Rauland Model HF 100		
MANUFACTURER	Rauland-Borg Corp., 3535 W. Addison Street, Chicago 18, Illinois		
TYPE SET	AC Operated 6 Tube FM Tuner		
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles	RATING	30 Watts, .5 Amp. @117 Volts AC
TUNING RANGE—FREQ. MOD.	88 — 108MC		

TUNING DRIVE CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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KJ327

SET 526 FOLDER 7

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.
Suggested Alignment Tools: A1 thru A6.... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A7..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

IF ALIGNMENT USING SIGNAL GENERATOR AND VTVM

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .01mfd to pin 7 (grid) of Mixer. Low side to chassis.	10.7MC (Unmod.)	Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	"	"	"	DC probe to point Ⓑ. Common to chassis.	A5	"
3.	"	"	"	DC probe to point Ⓒ. Common to chassis.	A6	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru .01mfd to pin 7 (grid) of Mixer. Low side to chassis.	10.7MC (450KC Swp)	Point of non-interference.	Vert. amp. to point Ⓐ. Low side to chassis.	A1, A2, A3, A4	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
2.	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A5	"
3.	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A6	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A5 for maximum amplitude and straightness of crossover lines.

RF ALIGNMENT

AFC "Off"

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru 270Ω to antenna terminal. Low side to chassis.	88MC (Unmod.)	88MC	DC probe to point Ⓑ. Common to chassis.	L4	Adjust by expanding or compressing coil turns for maximum deflection.
5.	"	108MC	108MC	"	A7	Adjust for maximum deflection.
6.	"	88MC	88MC	"	L3	Adjust by expanding or compressing coil turns for maximum deflection.

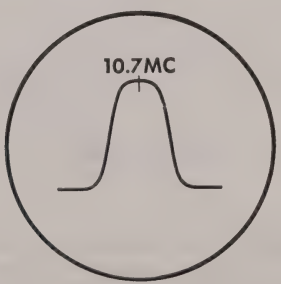


FIG. 1

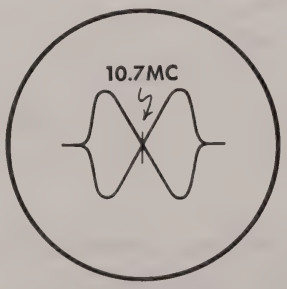


FIG. 2

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	RF Amp. -Mixer	12AT7
V2	Osc. -AFC	12AT7
V3	1st IF Amplifier	6CB6A
V4	2nd IF Amplifier	6AU6
V5	Ratio Detector	6AL5
V6	Tuning Indicator	EM84

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA RAULAND PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲75	150	CE-157A	AFH2-20	XB0183	FP214.5		TVL-2442.4	
B	▲75	150							
C2	8	450	CE-805B-D	PRS1715	BR845	TC71	TD-8-450	TVA-1704	Note 1
C3	8	25	CE-805H	XPP-25008	BBR8-150	TC41	TD-8-150	TVA-1405	

Note 1. Not used in some versions.

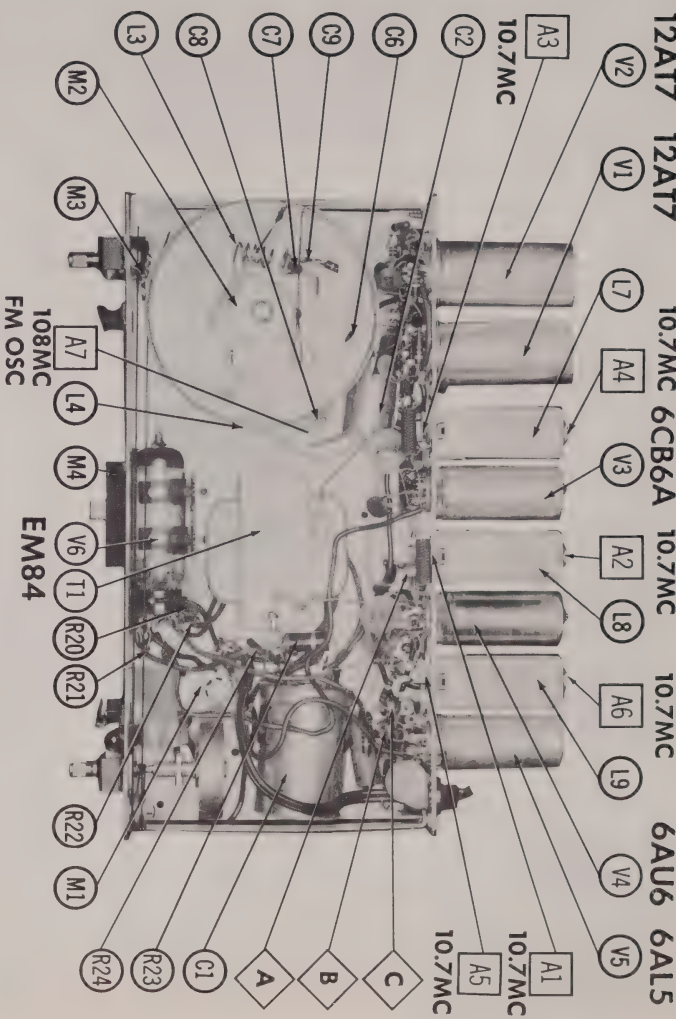
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C5	22 NPO 10%		NPO-DI 22	DTZ-22	C10Q22C	CCTO-220	CNO-422	10TCC-Q22
C6	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D51
C7	2.2 10%		NPO-SI 22	TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	
C8	.5-8							
C9	6.8 NPO 10%		NPO-DI 6.8	DTZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C10	100 N220 10%					*		10TCR-T10
C11	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C12	10 NPO		NPO-DI 10	DTZ-10	C10V1C	CCTO-100	CNO-410	10TCC-Q10
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C15	10 NPO		NPO-DI 10	DTZ-10	C10V1C	CCTO-100	CNO-410	10TCC-Q10
C16	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C18	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C19	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C20	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C21	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	330		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C24	330		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C25	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C26	330		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C27	560 10%		DI-560	DD-561	L10T56	CCD-561	GP356	10TS-T56
C28	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C29	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C30	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R1	68Ω	
R2	1.5meg	
R3	1000Ω	
R4	100Ω	
R5	470K	
R6	3.3meg	
R7	560Ω	
R8	10K	

ITEM No.	RATING	REMARKS
R9	1000Ω	
R10	1000Ω	
R11	150Ω	
R12	330K	
R13	5600Ω	
R14	22Ω	
R15	68K	
R16	10K	

ITEM No.	RATING	REMARKS
R17	10K	
R18	10K	
R19	10K	
R20	3.3meg	
R21	470K	
R22	1200Ω	
R23	1000Ω 2W	(560Ω) *
R24	150Ω	

* Alternate Value.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		RAULAND PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1	Ant. Coil		BC-560	4590	RTC-8514	.68uh
L2	RF Choke		BC-564	4608	RTC-8518	3.3uh
L3	RF Coil					
L4	Osc. Coil					
L5	Cathode Choke		BC-560	4590	RTC-8514	.68uh
L6	RF Choke		BC-560	4590	RTC-8514	.68uh
L7	1st IF Trans.	LR-0045	FM-254	1463	RTC-8599	
L8	2nd IF Trans.	LR-0046	FM-254	1463	RTC-8599	
L9	Ratio Detector	LQ-0182	FM-255	1465	RTC-8600	
L10	Fil. Choke		BC-560	4590	RTC-8514	.68uh
L11	Fil. Choke		BC-560	4590	RTC-8514	.68uh

TRANSFORMER (POWER)

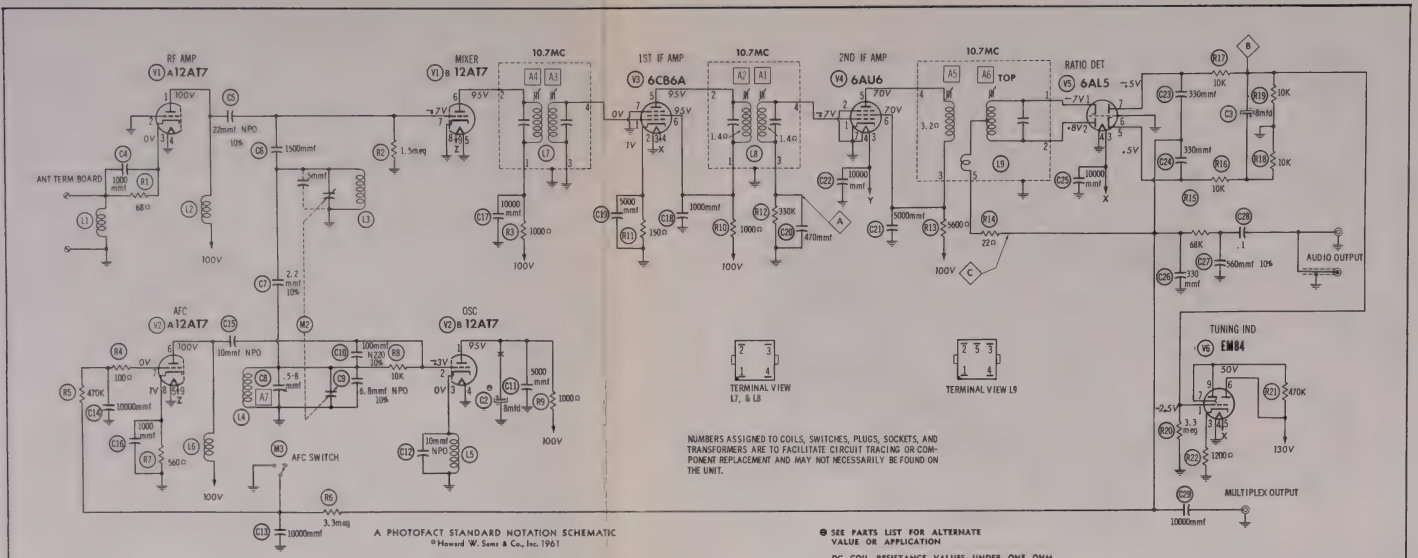
ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	RAULAND PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V Ⓐ .5A	120V Ⓐ .035A DC	6.3V Ⓐ 2A -	LP-0276	P-3045 ①	PA-8421 ①	26R38 ①		① Drill New Mounting Hole (s)

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	RAULAND PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.035A	JR-0032 *	1N1763 ♦	65 *	SR200 ♦	* Selenium Type ♦ Silicon Type

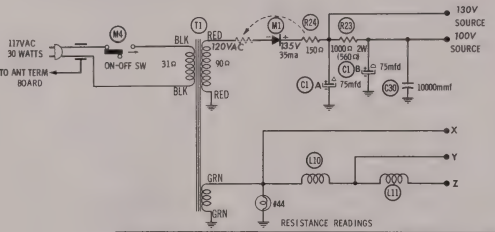
MISCELLANEOUS

ITEM No.	PART NAME	RAULAND PART No.	NOTES
M2	Tuning Cap.	CV 370B	2 Gang
M3	Switch		AFC Off-On
M4	Switch		Power Off-On (SPST, Slide Type)



● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

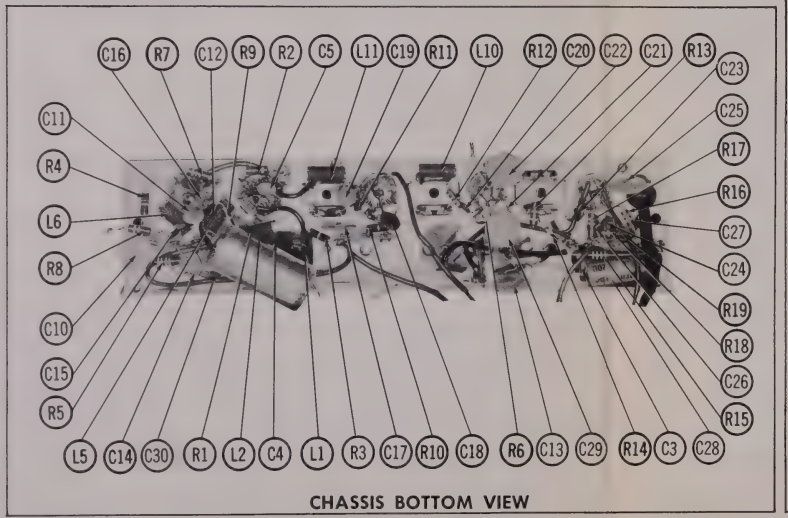


RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AT7	↑1100Ω	0Ω	68Ω	0Ω	0Ω	↑2100Ω	1.5meg	0Ω	.1Ω
V2	12AT7	↑2100Ω	10K	0Ω	0Ω	0Ω	↑1100Ω	470K ●INF	560Ω	.1Ω
V3	6CB6A	0Ω	150Ω	0Ω	.1Ω	↑2100Ω	↑2100Ω	0Ω		
V4	6AU6	330K	0Ω	.1Ω	0Ω	↑6700Ω	↑6700Ω	0Ω		
V5	6AL5	3.3meg	3.3meg	.1Ω	0Ω	20K	0Ω	20K		
V6	EM84	10K	NC	1200Ω	0Ω	.1Ω	↑150Ω	↑470K	NC	↑470K

ALL MEASUREMENTS MADE WITH "AFC" OFF UNLESS OTHERWISE DESIGNATED.
■ MEASURED WITH "AFC" ON.
↑ MEASURED FROM OUTPUT OF M1. NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. no signal applied for voltage measurements.



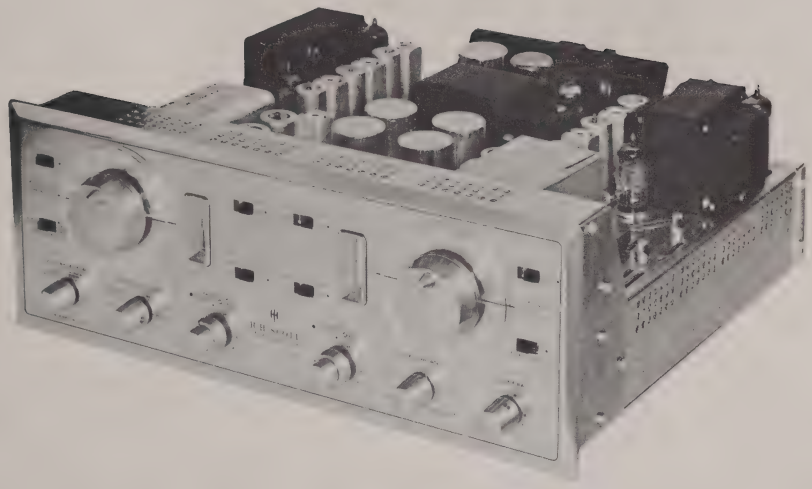
CHASSIS BOTTOM VIEW

RAULAND MODEL HF100

PHOTOFACT® Folder

H. H. SCOTT
MODEL 399

H. H. SCOTT
MODEL 399



H. H. SCOTT
MODEL 399

TRADE NAME	H. H. Scott Model 399		
MANUFACTURER	Herman Hosmer Scott, Inc., 111 Powder Mill Road, Maynard, Mass.		
TYPE SET	AC Operated 23 Tube FM-AM Receiver With Stereo Amplifier		
POWER SUPPLY	105 – 125 Volts AC, 50-60 Cycles	RATING	175 Watts, 1.5 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	540 – 1600KC	FREQ. MOD.	88 – 108MC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

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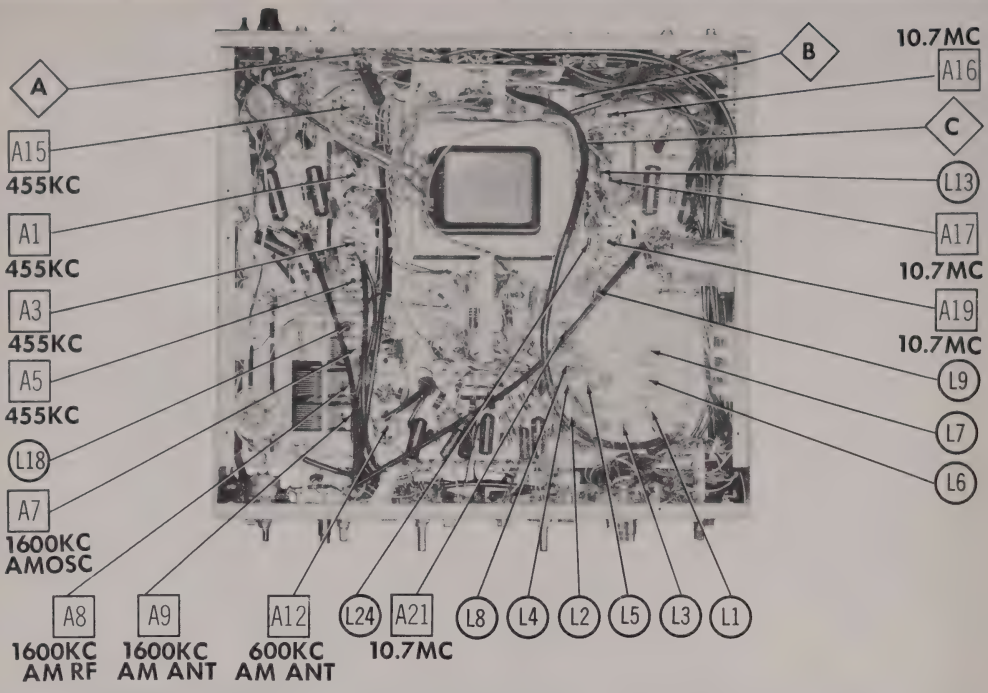
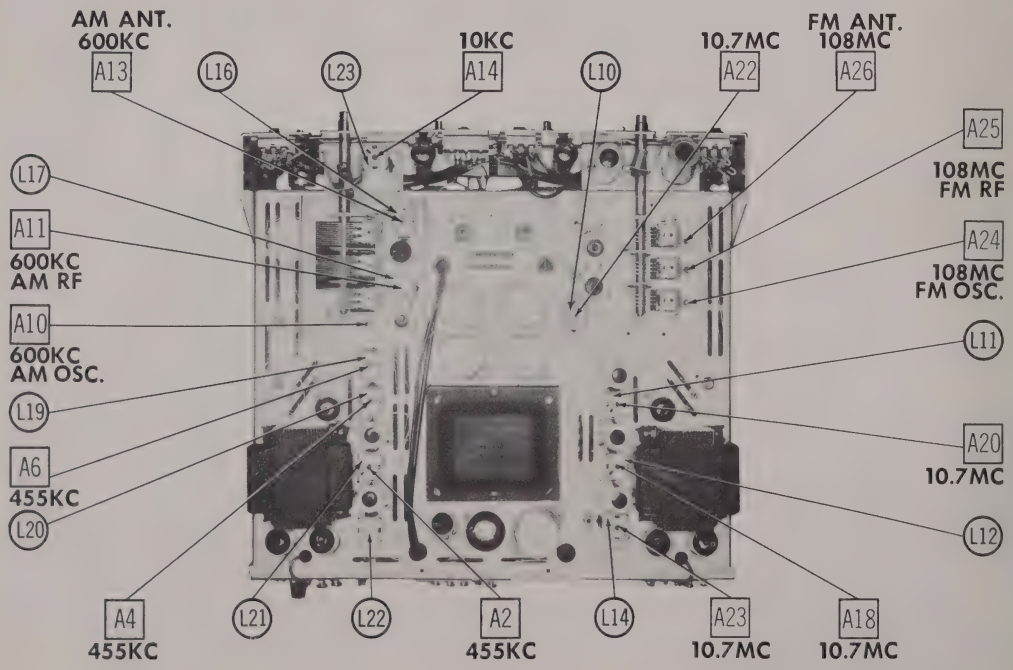


CHASSIS BOTTOM VIEW-ALIGNMENT & INDUCTOR IDENT.



CHASSIS TOP VIEW-ALIGNMENT & INDUCTOR IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.

Suggested Alignment Tools:

A1 Thru A6, A11 Thru A15, A17 Thru A22	GENERAL CEMENT #5097, 8727 WALSCO #2515
A7, A8, A9	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
A10, A16, A23	GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440 WALSCO #2526, 2543, 2544, 2545
A24, A25, A26	GENERAL CEMENT #5003, 8271, 8275, 8276, 8609, 8721, 8722, 9150, 9298 WALSCO #2516, 2518, 2519

AM ALIGNMENT—SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400~ Mod.)	(AM) Tuning gang fully open.	AC probe to point (A). Common to chassis.	A1, A2, A3, A4, A5, A6	Adjust for maximum deflection.
2.	High side thru .01mfd to AM antenna terminal (disconnect shorting link). Low side to chassis.	1600KC	1600KC	"	A7, A8, A9	"
3.	"	600KC	600KC	"	A10, A11, A12, A13	"
4.	"	1400KC (10KC Mod.)	1400KC Signal	"	A14, R12	Adjust for MINIMUM deflection.
5.	"	455KC (400~ Mod.)	1000KC	"	A15	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

Connect two matched 100K (± 1%) resistors in series from point (B) to chassis. The junction of these two resistors is alignment point (D) as shown on the schematic.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	High side thru .01mfd to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point (B). Common to chassis.	A16, A17, A18, A19, A20, A21, A22	Adjust for maximum deflection.
7.	"	"	"	DC probe to point (C). Common to point (D).	A23	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	High side thru .01mfd to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point (B). Low side to chassis.	A16, A17, A18, A19, A20, A21, A22	Disconnect stabilizing capacitor C4D. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C4D.
7.	"	"	"	Vert. amp. to point (C). Low side to chassis.	A23	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A16 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	High side thru 270Ω to FM antenna terminal. Low side to chassis.	108MC (Unmod.)	(FM) 108MC	DC probe to point (B). Common to chassis.	A24, A25, A26	Adjust for maximum deflection.
9.	"	90MC	90MC	"	L7, L6, L1	Adjust for maximum deflection by expanding or compressing coil turns.

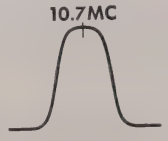


FIG. 1

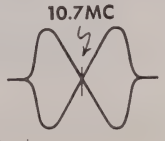
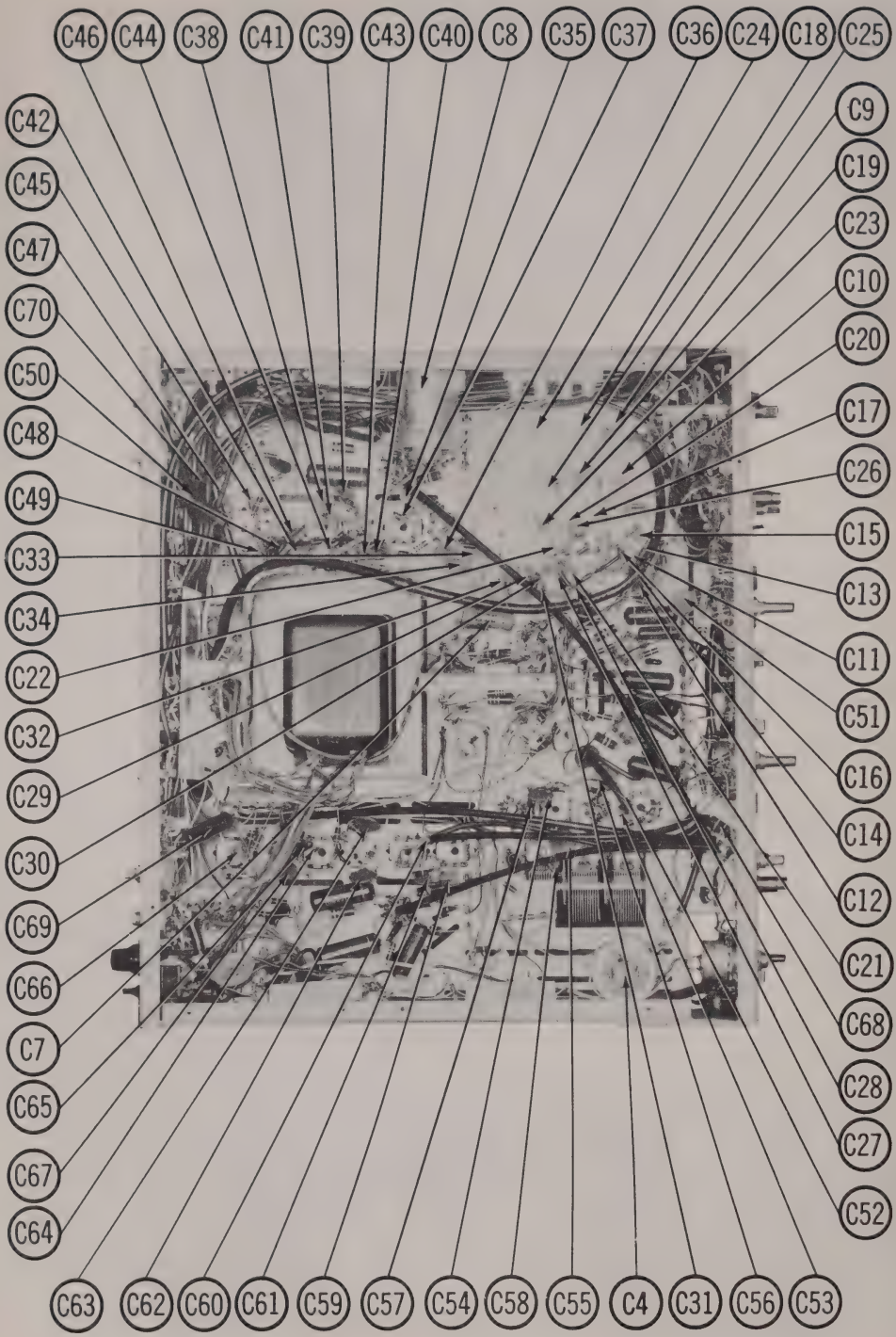
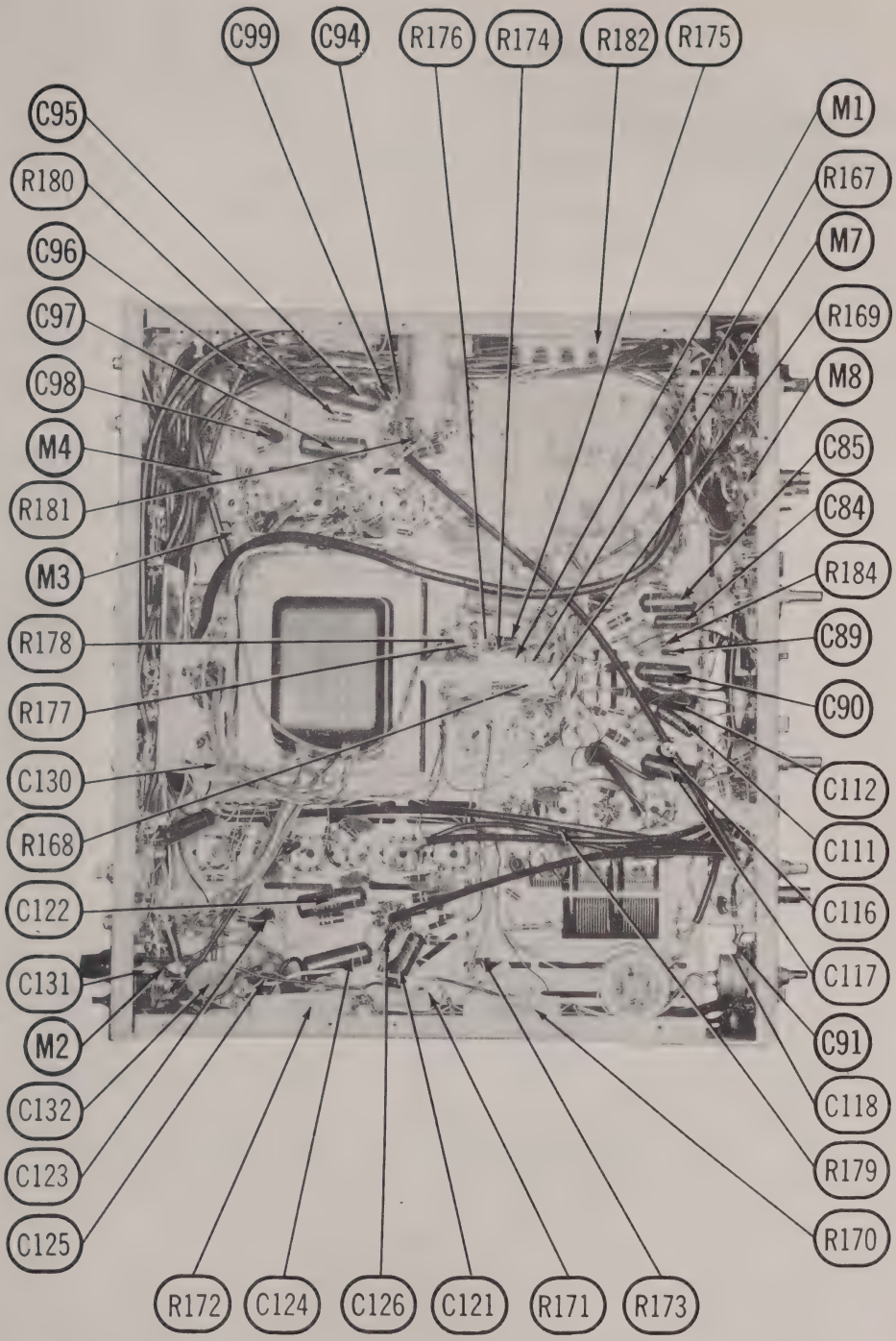


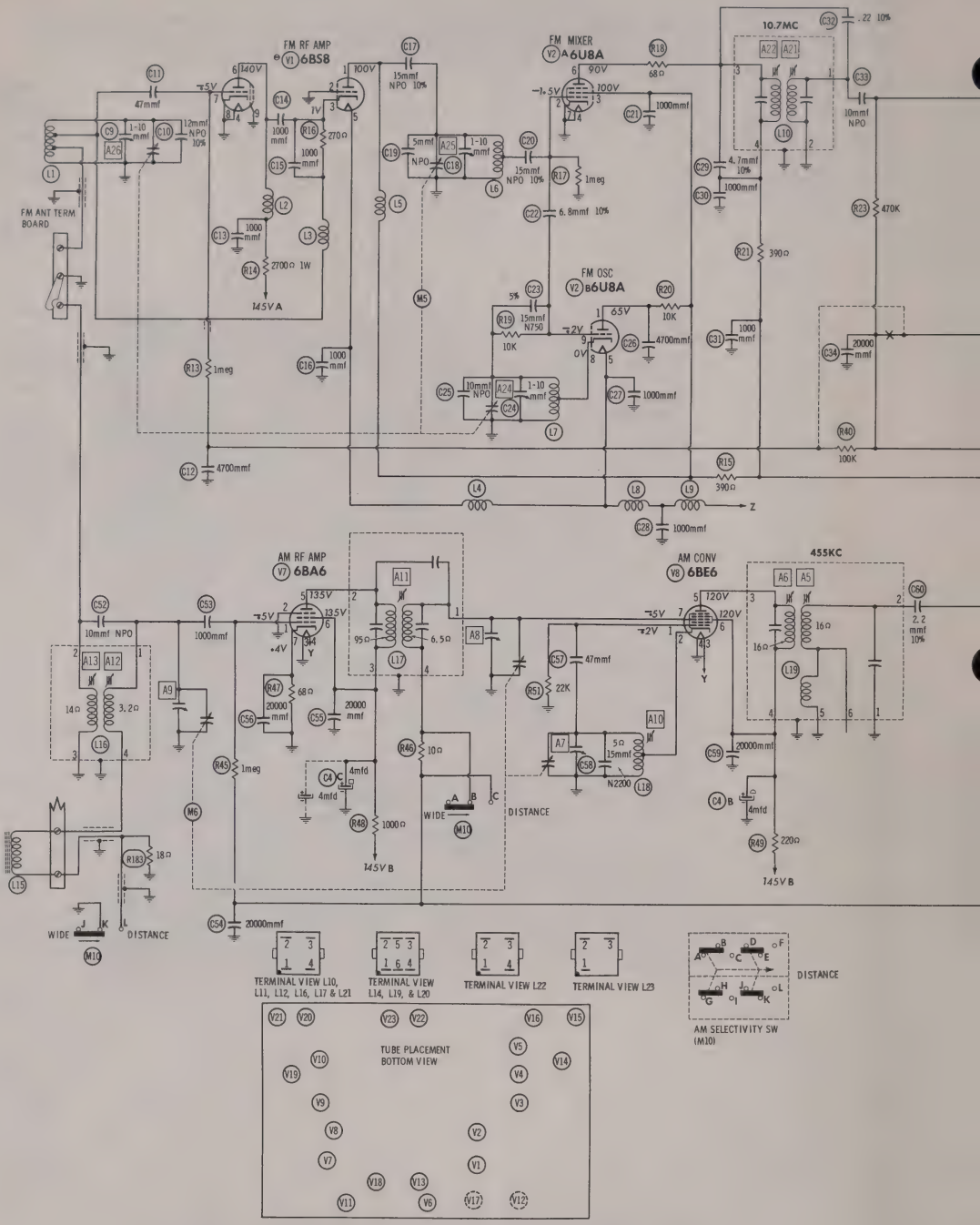
FIG. 2



CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW - CAPACITOR, RESISTOR & MISC IDENT.



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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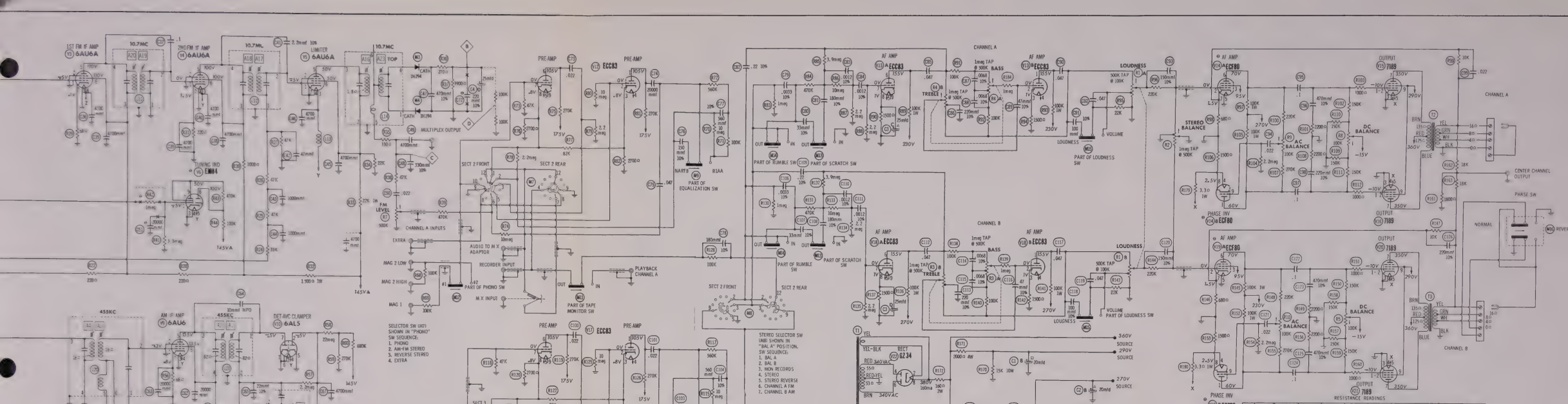


SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of +15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BS8	†3000Ω	0Ω	270Ω	0Ω	.1Ω	†3400Ω	1.2meg	0Ω	0Ω
V2	6U8A	†13K	1meg	†3000Ω	0Ω	.1Ω	†3000Ω	0Ω	0Ω	10K
V3	6AU6A	600K	0Ω	0Ω	.1Ω	†2600Ω	†2600Ω	68Ω		
V4	6AU6A	0Ω	0Ω	.1Ω	0Ω	†3200Ω	†3200Ω	220Ω		
V5	6AU6A	47K	0Ω	.1Ω	0Ω	†22K	†22K	0Ω		
V6	EM84	1meg	NC	0Ω	0Ω	.1Ω	†100K	†570K	NC	†570K
V7	6BA6	2.3meg	0Ω	0Ω	.1Ω	†1700Ω	†1700Ω	68Ω		
V8	6BE6	22K	0Ω	2Ω	0Ω	†1000Ω	†1000Ω	1.3meg		
V9	6AU6A	1meg	0Ω	0Ω	.1Ω	†1500Ω	†1500Ω	68Ω		
V10	6AL5	0Ω	1.5meg	0Ω	.1Ω	0Ω	0Ω	120K		
V11	EM84	1.3meg	NC	0Ω	0Ω	.1Ω	†100K	†570K	NC	†570K
V12	ECC83 12AX7	†350K	500K	2700Ω	1.4Ω	0Ω	†350K	0Ω	2700Ω	NC
V13	ECC83 12AX7	†130K	2meg	1500Ω	50Ω	30Ω	†130K	2.2meg	1500Ω	NC
V14	ECF80	†120K	220K	†40K	2Ω	0Ω	†120K	680Ω	1500Ω	2.2meg
V15	7189	NC	250K	0Ω	0Ω	.1Ω	NC	†295Ω	NC	†2000Ω
V16	7189	NC	250K	0Ω	0Ω	.1Ω	NC	†285Ω	NC	†2000Ω
V17	ECC83 12AX7	†350K	500K	2700Ω	30Ω	1.4Ω	†350K	0Ω	2700Ω	NC
V18	ECC83 12AX7	†130K	2meg	1500Ω	70Ω	50Ω	†130K	2.2meg	1500Ω	NC
V19	ECF80	†120K	220K	†40K	2Ω	0Ω	†120K	680Ω	1500Ω	2.2meg
V20	7189	NC	250K	0Ω	0Ω	.1Ω	NC	†295Ω	NC	†2000Ω
V21	7189	NC	250K	0Ω	0Ω	.1Ω	NC	†285Ω	NC	†2000Ω
V22	GZ34 5AR4	NC	¶	NC	55Ω	NC	NC	¶		
V23	6X4	52Ω	NC	.1Ω	0Ω	NC	51Ω	¶		

ALL MEASUREMENTS MADE IN "AM-FM STEREO" POSITION.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V22.
† MEASURED FROM PIN 7 OF V23.
NC NO CONNECTION

H. H. SCOTT MODEL 399

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	FM RF Amplifier	6BS8 (6BQ7) *
V2	FM Mixer - FM Osc.	6U8A
V3	1st FM IF Amplifier	6AU6A
V4	2nd FM IF Amplifier	6AU6A
V5	FM Limiter	6AU6A
V6	FM Tuning Indicator	EM84 (6FG6) *
V7	AM RF Amplifier	6BA6
V8	AM Converter	6BE6
V9	AM IF Amplifier	6AU6A
V10	AM Det. -AVC Clamper	6AL5
V11	AM Tuning Indicator	EM84 (6FG6) *
V12	Channel A Preamplifier	ECC83/12AX7

ITEM No.	USE	TYPE
V13	Channel A AF Amplifier	ECC83/12AX7
V14	Channel A AF Amplifier - Phase Inverter	ECF80 (6BL8) *
V15	Channel A Output	7189
V16	Channel A Output	7189
V17	Channel B Preamplifier	ECC83/12AX7
V18	Channel B AF Amplifier	ECC83/12AX7
V19	Channel B AF Amplifier - Pase Inverter	ECF80 (6BL8) *
V20	Channel B Output	7189
V21	Channel B Output	7189
V22	Rectifier	GZ34/5AR4
V23	Rectifier	6X4

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA H.H. SCOTT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲30	475	CEC-30-20-475	AFH2-69	B0487	FP284	TMD-61	TVL-2935	
B	■20	475							
C2A	▲30	475	CEC-30-20-475	AFH2-69	B0487	FP284	TMD-61	TVL-2935	
B	▲20	475							
C3A	▲20	450	CEC-2X20-2X25	AFH4-67	D0520	FP430.97	TMQ-73	TVL-4724.2	
B	■20	450							
C	▲25	25							
D	25	25							
C4A	▲4	250	CEC-3X4-25	AFH4-43	D0070	WP433.6	TMQ-9	TVL-4759.7	
B	▲4	250			BBR25-25	TC26	TD-25-25	TVA-1205	
C	■4	250							
D	25	25						TVLPS-3360*	
C5A	▲100	75	CEC-2X100-10CP						
B	■100	75							
C	▲10	75							
C6A	▲100	75	CEC-2X100-10CP						
B	■100	75							
C	▲10	75							
C7	10	25	CET-10/25	PRS1250	BBR10-25	TC22	TD-10-25	TVA-1204	
C8A	40	250	CEC-4X40-250			WP412.8	TMQ-116	TVLS-4581 *	
B	▲40	250							
C	■40	250							
D	▲40	250							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C9	1-10			829-10				
C10	12 NPO 10%			TCZ-12	C10Q1C	CCTO-120	CNO-412	10TCC-Q12
C11	47		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C12	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C13	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C14	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C15	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C16	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C17	15 NPO 10%		NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C18	1-10			829-10				

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C19	5 NPO		NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C20	15 NPO 10%		NPO-DI 15	DTZ-15	C10V15C	CCTO-150	CNO-415	10TCC-Q15
C21	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C22	6.8 10%		NPO-SI 6.8	TCZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C23	15 N750 5%		N750-DI 15	DTN-15	C10Q15U	CCTN-150	CN7-415	10TCU-Q15
C24	1-10			829-10				
C25	10 NPO		NPO-DI 10	DTZ-10	C10Q1C	CCTO-150	CNO-410	10TCC-Q10
C26	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C27	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C28	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C29	4.7 10%		NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C30	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C31	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C32	.22 10%							
C33	10 NPO		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C34	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C35	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C36	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C37	.1							
C38	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C39	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C40	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C41	2.2 10%		NPO-SI 2.2	TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C42	47		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C43	1000		BPD-001	DD-103	BYA10D1	CCD-102	B-210	5HK-D10
C44	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C45	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C46	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C47	470 10%		1469-00047		5R5T47	CM-19B-471K	MCJ244	MS-347
C48	330 10%		1469-00033		5R5T33	CM-19B-331K	MCB241	MS-333
C49	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C50	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C51	20000	Note 1	BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C52	10 NPO		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C53	1000		DI-1000	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C54	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C55	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C56	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C57	47		1468-000047	DTZ-47	5W5Q47	CM-19B-470M *	CNO-447	1FM-447
C58	15 N2200							
C59	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C60	2.2 10%		NPO-SI 2.2	TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C61	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C62	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C63	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C64	10 NPO		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C65	22 10%		1469-000022	TCZ-22	C10Q22C	CM-19B-220K	CNO-422	MS-422
C66	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C67	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C68	.0082 400V 10%		P684CM-0082		DPMS6D82	6DP-2-822	GEM-16282	6PS-D82
C69	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C70	4700	Note 1	BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C71	82 10%		1469-000082	TCZ-82	22R5Q82	CM-19B-820K	CNO-482	MS-482
C72	220 10%		1469-00022	TCZ-220	5R5T22	CM-19B-220K	CNO-322	MS-322
C73	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C74	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C75	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C76	150 10%		1469-00015	TCZ-150	22R5T15	CM-19B-151K	MCB236	MS-315
C77	560 10%		1469-00056		5R5T56	CM-19B-561K	MCJ247	MS-356
C78	180 10%		1469-00018	TCZ-180	22R5T18	CM-19B-180K	CNO-318	MS-318
C79	.0033 400V 10%		V84C4D33-10%		PM6D33	6DP-1-332	GEM-16233	6TM-D33
C80	33 10%		1469-000033	TCZ-33	22R5Q33	CM-19B-330K	CNO-433	MS-433
C81	180 10%		1469-00018	TCZ-180	22R5T18	CM-19B-181K	CNO-318	MS-318
C82	.22 10%							
C83	.0012 400V 10%		P684CM-0012	DD-122	DPMS6D12	6DP-1-122	GP212	6PS-D12

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C84	.0012 400V 10%		P684M-0012	DD-122	DPMS6D12	6DP-1-122	GP212	6PS-D12
C85	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C86	220 10%		1469-00022	TCZ-220	5R5T22	CM-19B-221K	CNO-322	MS-322
C87	.0068 400V 10%		V84C4D68-10%		PM6D68	6DP-1-682	GEM-16268	6TM-D68
C88	.0068 400V 10%		V84C4D68-10%		PM6D68	6DP-1-682	GEM-16268	6TM-D68
C89	47 10%		1469-000047	TCZ-47	22R5Q47	CM-19B-470M	CNO-447	MS-447
C90	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C91	100 10%		1469-0001	TCZ-100	22R5T1	CM-19B-101K	MCB235	MS-310
C92	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C93	150 10%		1469-00015	TCZ-150	22R5T15	CM-19B-151K	MCB236	MS-315
C94	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C95	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C96	470 10%		1469-00047		5R5T47	CM-19B-471K	MCJ244	MS-347
C97	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C98	470 10%		1469-00047		5R5T47	CM-19B-471K	MCJ244	MS-347
C99	220 10%		1469-00022	TCZ-220	22R5T22	CM-19B-221K	CNO-322	MS-322
C100	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C101	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C102	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C103	150 10%		1469-00015	TCZ-150	22R5T15	CM-19B-151K	MCB236	MS-315
C104	560 10%		1469-00056		5R5T56	CM-19B-561K	MCJ247	MS-356
C105	180 10%		1469-00018	TCZ-180	22R5T18	CM-19B-181K	CNO-318	MS-318
C106	.0033 400V 10%		V84C4D33-10%		PM6D33	6DP-1-332	GEM-16233	6TM-D33
C107	33 10%		1469-000033	TCZ-33	22R5Q33	CM-19B-330K	CNO-433	MS-433
C108	180 10%		1469-00018	TCZ-180	22R5T18	CM-19B-181K	CNO-418	MS-318
C109	.22 10%							
C110	.0012 400V 10%		P684CM-0012	DD-122	DPMS6D12	6DP-1-122	GP212	6PS-D12
C111	.0012 400V 10%		P684CM-0012	DD-122	DPMS6D12	6DP-1-122	GP212	6PS-D12
C112	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C113	220 10%		1469-00022	TCZ-220	22R5T22	CM-19B-221K	CNO-322	MS-322
C114	.0068 400V 10%		V84C4D68-10%		PM6D68	6DP-1-682	GEM-16268	6TM-D68
C115	.0068 400V 10%		V84C4D68-10%		PM6D68	6DP-1-682	GEM-16268	6TM-D68
C116	47 10%		1469-000047	TCZ-47	22R5Q47	CM-19B-470K	CNO-447	MS-447
C117	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C118	100 10%		1469-0001	TCZ-100	22R5T1	CM-19B-101K	MCB235	MS-310
C119	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C120	150 10%		1469-00015	TCZ-150	22R5T15	CM-19B-151K	MCB236	MS-315
C121	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C122	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C123	470 10%		1469-00047		5R5T47	CM-19B-471K	MCJ244	MS-347
C124	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C125	470 10%		1469-00047		5R5T47	CM-19B-471K	MCJ244	MS-347
C126	220 10%		1469-00022	TCZ-220	22R5T22	CM-19B-221K	CNO-322	MS-322
C127	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C128	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C129	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C130	20000 1400V	Note 1			CUB16S2	16DP-4-203	GEM-1612	MB-S2
C131	20000 1400V	Note 1			CUB16S2	16DP-4-203	GEM-1612	MB-S2
C132	20000 1400V	Note 1			CUB16S2	16DP-4-203	GEM-1612	MB-S2

Note 1. Not used in some versions.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	H. H. SCOTT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	500K	½	RCVD-500KT	BT-66			FA55T15	Loudness, Channel A
	100K Tap							
B	500K	½		STR-66			RU55T15	Loudness, Channel B
	100K Tap							
C	Shaft			Not Req.			CS3500	
D	Switch			KR-1			US41	
R2A	1meg	½	RCV-1MST-3P	BT-71	A47F5-1meg	Q19-137X	UT-443	Stereo Balance
	500K Tap							
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

CONTROLS (cont)

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	H. H. SCOTT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R3A	1meg	½	RCVC-1MT	F1-56			■ UE4135	Bass, Channel B
	500K Tap							
B	1meg	½		R2-56				Treble, Channel B
	500K Tap							
R4A	1meg	½	RCVC-1MT	F1-56			■ UE4135	Bass, Channel A
	500K Tap							
B	1meg	½		R2-56				Treble, Channel A
	500K Tap							
R5A	100K	½	RCV-100K-S-2	BX-40	A47-100K-S	Q11-128	SU-41	DC Balance, Channel B
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R6A	500K	½	RCV-500K-P	BX-59	A47-500K-S	Q11-133	SU-50	AM Level
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R7A	500K	½	RCV-500K-P	BX-59	A47-500K-S	Q11-133	SU-50	FM Level
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R8A	100K	½	RCV-100K-S-2	BX-40	A47-100K-S	Q11-128	SU-41	DC Balance, Channel A
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R9A	100K	½	RCV-100K-P	BX-40	A47-100K-S	Q11-128	SU-41	AC Balance, Channel A
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R10A	100K	½	RCV-100K-P	BX-40	A47-100K-S	Q11-128	SU-41	AC Balance, Channel B
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R11A	5000Ω	½	RCV-5K-P	BX-10	A47-5000-S	Q11-114	SU-14	Bias Adjust
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R12	1500Ω	2(WW)	RWV-1.5K		39-1500	112-1500	FL-1.5K	10KC Filter

■ "STA-LOC" equivalent: FBI6T55, RU16T55, OS687, IS937.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R13	1meg	
R14	2700Ω 1W	
R15	390Ω	
R16	270Ω	
R17	1meg	
R18	68Ω	
R19	10K	
R20	10K	
R21	390Ω	
R22	220Ω	
R23	470K	
R24	33K	
R25	47K	
R26	47K	
R27	47K	
R28	220Ω	
R29	68Ω	
R30	1000Ω	
R31	220Ω	
R32	1500Ω 1W	
R33	22K 1W	
R34	22K	
R35	330Ω	
R36	270Ω	
R37	3900Ω	
R38	47K	
R39	470K	
R40	100K	
R41	3.3meg	
R42	1meg	Note 1
R43	470K	
R44	100K	
R45	1meg	
R46	10Ω	
R47	68Ω	
R48	1000Ω	

ITEM No.	RATING	REMARKS
R49	2200Ω	
R50	220K	
R51	22K	
R52	1meg	
R53	4.7meg	
R54	100K	
R55	680Ω	
R56	68Ω	
R57	2.2meg	
R58	22meg	
R59	270K	
R60	680K	
R61	6800Ω	
R62	2200Ω	
R63	470K	
R64	4000Ω 7W	IRC#PW10-4000Ω
R65	100K	
R66	3.3meg	
R67	470K	
R68	100K	
R69	100K	
R70	10meg	
R71	100K	
R72	560K	
R73	47K	
R74	10meg	
R75	270K	
R76	2700Ω	
R77	82K	
R78	2.2meg	
R79	2.2meg	
R80	10meg	
R81	270K	
R82	2700Ω	
R83	1meg	
R84	470K	

ITEM No.	RATING	REMARKS
R85	3.9meg	
R86	10meg	
R87	2.2meg	
R88	2.2meg	
R89	100K 1W	
R90	1500Ω	
R91	100K	
R92	100K	
R93	100K 1W	
R94	1500Ω	
R95	22K	
R96	220K	
R97	100K 1W	
R98	680Ω	
R99	10K	
R100	220K	
R101	2200Ω	
R102	150K	
R103	1000Ω	
R104	2.2meg	
R105	100K 1W	
R106	1500Ω	
R107	270K	
R108	2200Ω	
R109	150K	
R110	150K	
R111	150K	
R112	1000Ω	
R113	100K	
R114	100K	
R115	10meg	
R116	100K	
R117	560K	
R118	47K	
R119	270K	
R120	2700Ω	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (IRC or EQUIVALENT) (cont)

ITEM No.	RATING	REMARKS
R121	2.2meg	
R122	82K	
R123	2.2meg	
R124	3.3meg	
R125	10meg	
R126	270K	
R127	2700Ω	
R128	100K	
R129	100K	
R130	1meg	
R131	470K	
R132	3.9meg	
R133	10meg	
R134	2.2meg	
R135	2.2meg	
R136	100K 1W	
R137	1500Ω	
R138	100K	
R139	1meg	
R140	100K	
R141	100K 1W	
R142	1500Ω	

ITEM No.	RATING	REMARKS
R143	22K	
R144	220K	
R145	100K 1W	
R146	680Ω	
R147	10K	
R148	220K	
R149	2200Ω	
R150	150K	
R151	1000Ω	
R152	100K 1W	
R153	1500Ω	
R154	2.2meg	
R155	270K	
R156	2200Ω	
R157	150K	
R158	150K	
R159	150K	
R160	10000Ω	
R161	1800Ω	
R162	18K	
R163	18K	
R164	47K	

ITEM No.	RATING	REMARKS
R165	56K 1W	
R166	47K 1W	
R167	10K 1W	
R168	3300Ω 1W	
R169	22K 1W	
R170	15K 10W	IRC#PW10-15K
R171	2000Ω 4W	IRC#PW5-2000Ω
R172	160Ω 2W	
R173	82K	
R174	10K	
R175	18Ω 1W	
R176	18Ω 1W	
R177	18Ω 1W	
R178	10Ω 2W	(33Ω) *
R179	3.3Ω 1W	
R180	3.3Ω 1W	
R181	100K	Note 1
R182 A	250Ω	
B	250Ω	
C	250Ω	
R183	18Ω	
R184	1meg	

Note 1. Not used in some versions.
* Alternate Value.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA H.H. SCOTT PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	NOTES
L1	FM Ant. Trans.					
L2	RF Choke			4586		.33uh
L3	Cathode Choke		BC-561	4602	RTC-8515	1.2uh
L4	Fil. Choke		BC-561	4602	RTC-8515	1uh
L5	RF Choke		BC-561	4602	RTC-8515	1uh
L6	FM RF Coil					
L7	FM Osc. Coil					
L8	Fil. Choke		BC-561	4602	RTC-8515	1uh
L9	Fil. Choke		BC-561	4602	RTC-8515	1uh
L10	1st FM IF Trans.		FM-254	1463	RTC-8599	
L11	2nd FM IF Trans.		FM-254	1463	RTC-8599	
L12	3rd FM IF Trans.		FM-254	1463	RTC-8599	
L13	Fil. Choke		BC-561	4602	RTC-8515	1uh
L14	Ratio Detector		FM-255	1465	RTC-8600	
L15	Loopstick		BC-419	705-A		
L16	AM Ant. Trans.		BC-386 *		RTC-8731 *	* Drill Mounting Hole
L17	AM RF Trans.		BC-388 *		RTC-8732 *	
L18	AM Osc. Coil		BC-394	70-OSC	RTC-8647	
L19	1st AM IF Trans.					
L20	2nd AM IF Trans.					
L21	3rd AM IF Trans.		BC-353	12-C2	RTC-8633	
L22	455KC IF Trap Coil					
L23	10KC Fliter Coil					
L24	Fil. Choke		BC-561	4602	RTC-8515	1uh

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA H.H. SCOTT PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V@ 1.5A	680VCT @.160A	350VCT @.070A	TR-12-9					
	SEC. 3	SEC. 4	SEC. 5						
	5V@ 1.9A	6.3V@ 3.9A	6.3V@ 4.7A						
	SEC. 6								
	50V@ .240A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC.	REPLACEMENT DATA H.H. SCOTT PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	6500Ω CT	16Ω Tap@ 8Ω, 4Ω	TRA-8-4					
T3	6500Ω CT	16Ω Tap@ 8Ω, 4Ω	TRA-8-4					

POWER RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA H.H. SCOTT PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.150A	*				* Selenium Type

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA H.H. SCOTT PART No. FUSE	H.H. SCOTT PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	3AG	2½A 125V S/B			31302.5 (3AG 2½A 125V S/B)	342001	MDL 2½	HKP

SIGNAL DIODES

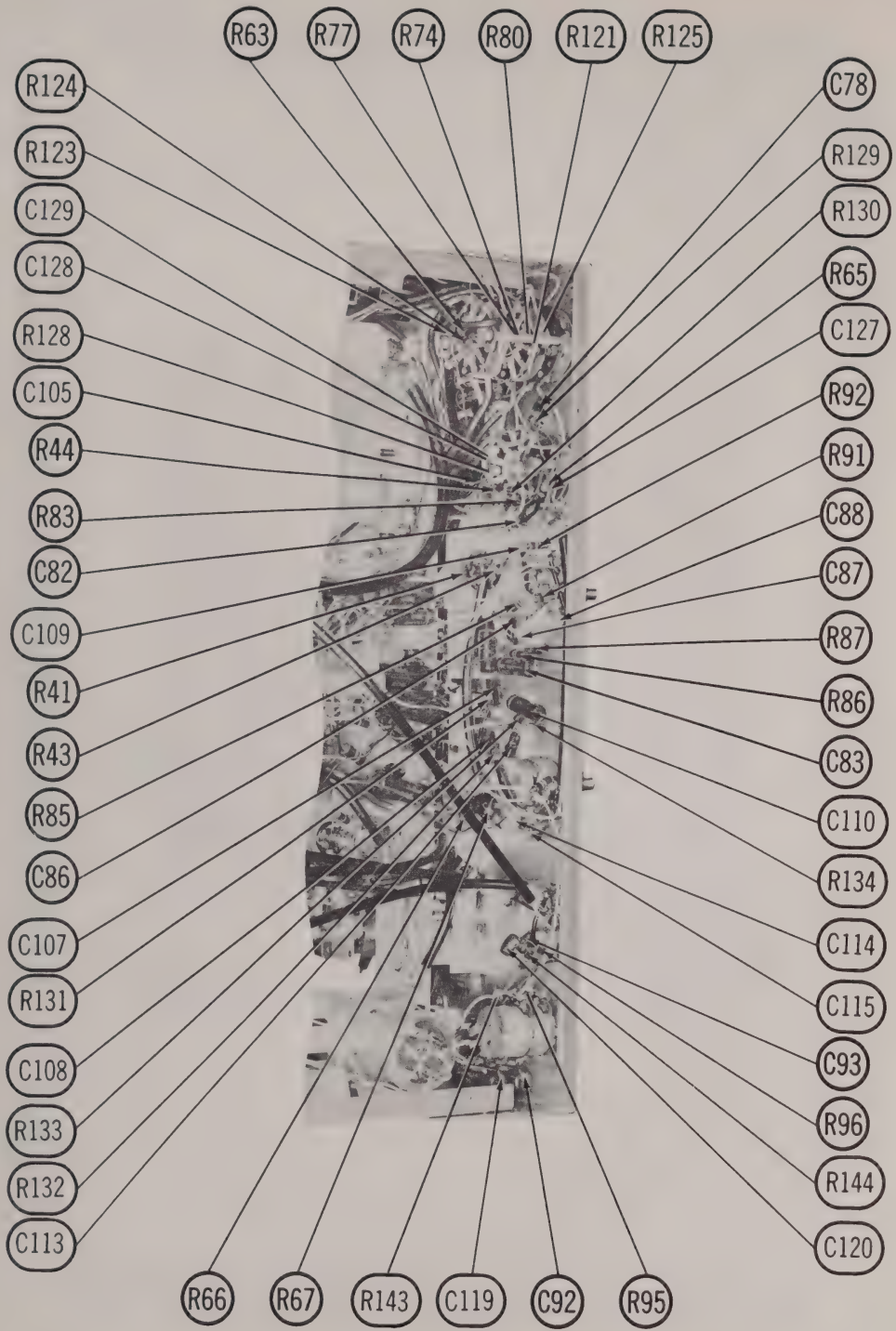
ITEM No.	ORIG. TYPE	REPLACEMENT DATA H.H. SCOTT PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M3	1N294			1N294	1N294	FM Detector (Pigtail)
M4	1N294			1N294	1N294	FM Detector (Pigtail)

MISCELLANEOUS

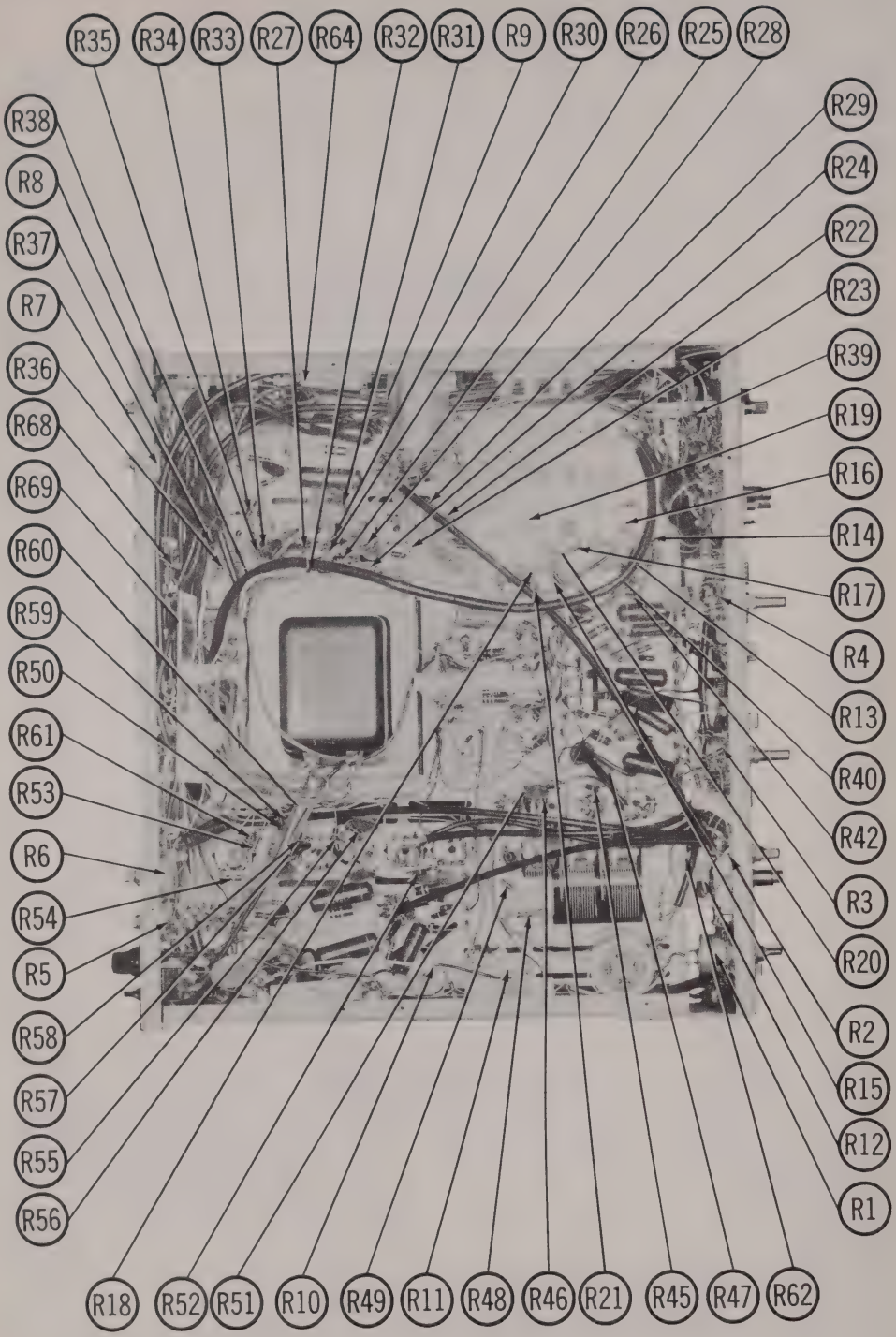
ITEM No.	PART NAME	H.H. SCOTT PART No.	NOTES
M5	Tuning Cap.		FM, 3 Gang
M6	Tuning Cap.		AM, 3 Gang (Ant. 23—385mmf, RF 19—380mmf, Osc. 35—235mmf)
M7	Switch		Input Selector (Rotary Wafer Type)
M8	Switch		Stereo Selector (Rotary Wafer Type)
M9	Switch		Equalization (DPDT Slide Type)
M10	Switch		AM Selectivity (DPDT Slide Type)
M11	Switch		Tape Monitor (DPDT Slide Type)
M12	Switch		Pickup (DPDT Slide Type)
M13	Switch		Scratch Filter (DPDT Slide Type)
M14	Switch		Rumble Filter (DPDT Slide Type)
M15	Switch		Loudness,- Volume (DPDT Slide Type)
M16	Switch		Phase (DPDT Slide Type)

WIRING DATA

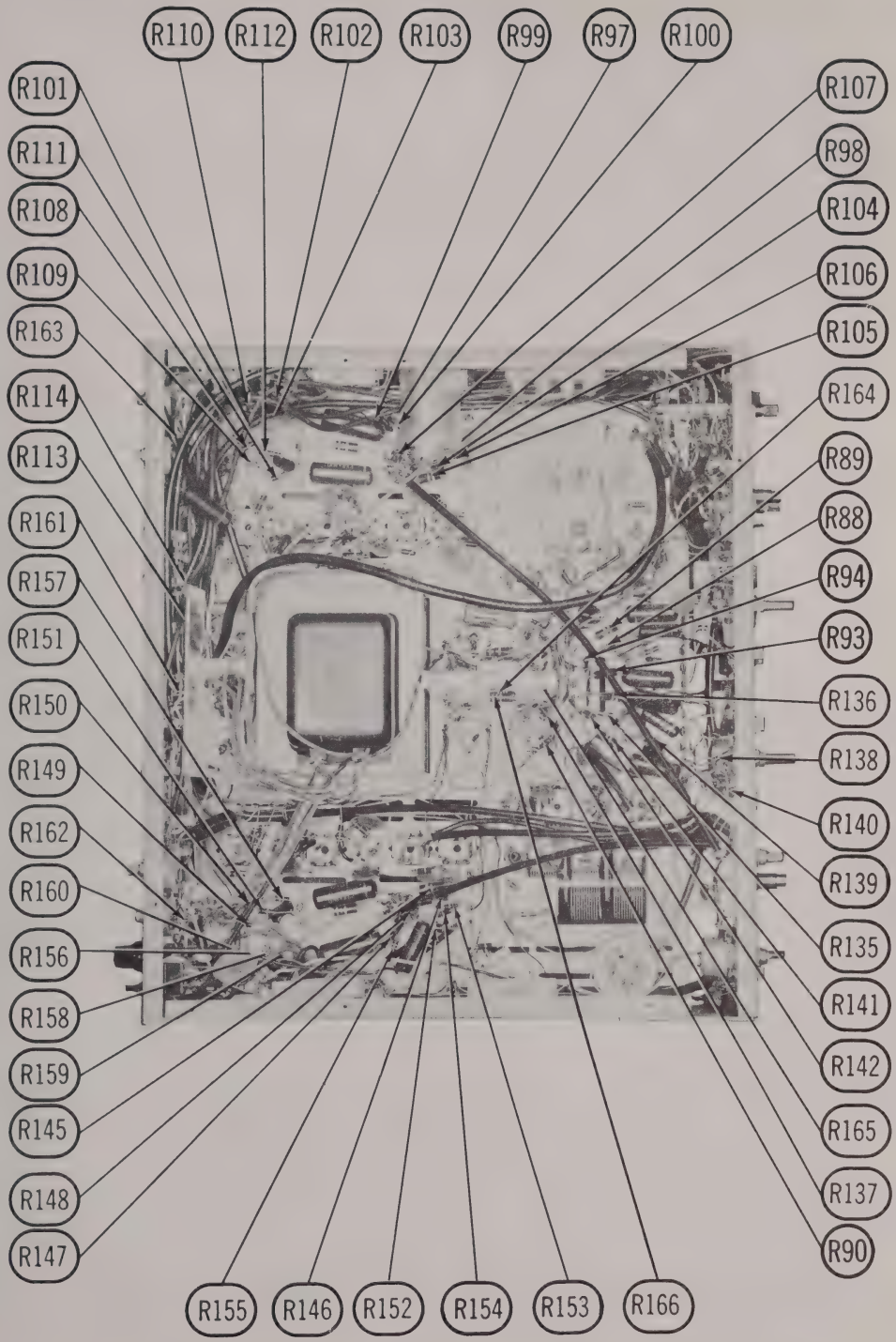
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



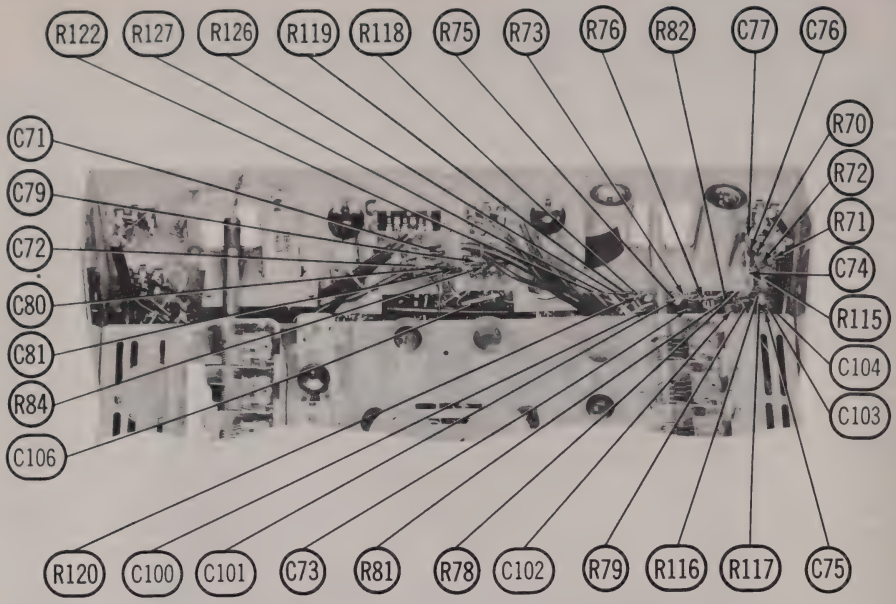
CONTROL PANEL-BOTTOM REAR VIEW



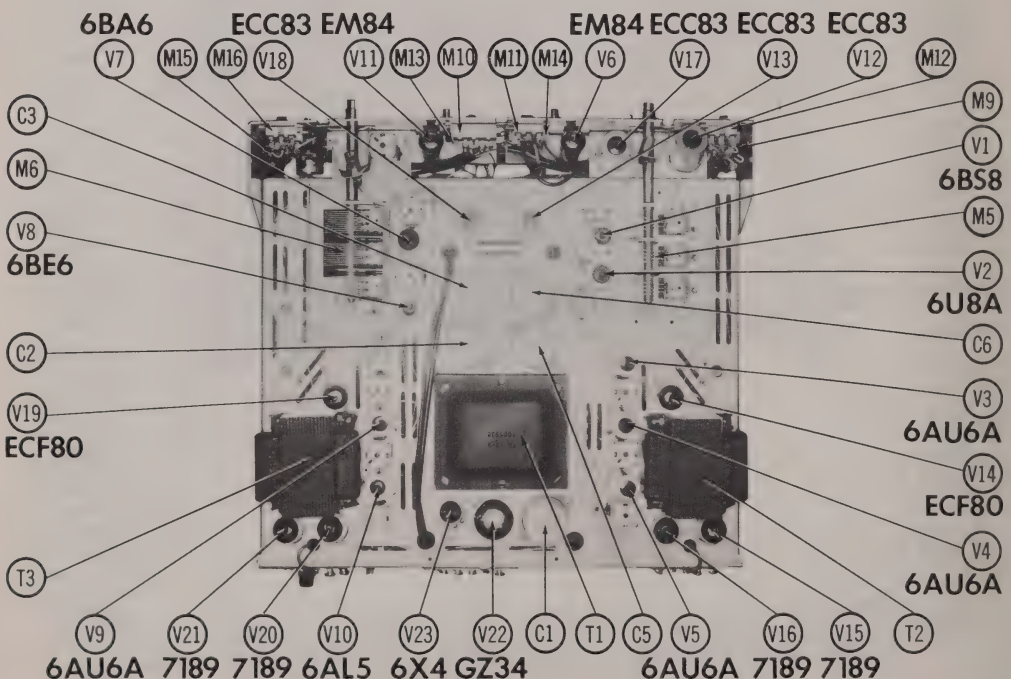
CHASSIS-BOTTOM VIEW-RESISTOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CONTROL PANEL-TOP REAR VIEW



CHASSIS-TOP VIEW

PHOTOFACT® Folder with CIRCUITRACE®

SILVERTONE MODELS 1039, 1040, 1041 (Ch. 528.54040)

SILVERTONE MODELS
1039, 1040, 1041 (Ch. 528.54040)

SILVERTONE MODELS
1039, 1040, 1041 (Ch. 528.54040)

TRADE NAME	Silvertone Models 1039, 1040, 1041 (Ch. 528.54040)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	AC Operated 6 Tube AM Receiver With Electric Clock
POWER SUPPLY	105 – 125 Volts AC, 60 Cycles RATING 26 Watts, .25 Amp. @117 Volts AC (Less Clock)
TUNING RANGE—BROADCAST	540 – 1600KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1 Thru A4.....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A5, A7, A9.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A6, A8.....GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1630KC	"	"	A5	"
3.	"	532KC	Tuning gang fully closed.	"	A6	Adjust for maximum output. Repeat Steps 2 and 3.
4.	Loop	1400KC	1400KC	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
5.	"	600KC	600KC	"	A8	Adjust for maximum output. Repeat Steps 4 and 5.
6.	"	1400KC	1400KC	"	A9	Adjust for maximum output.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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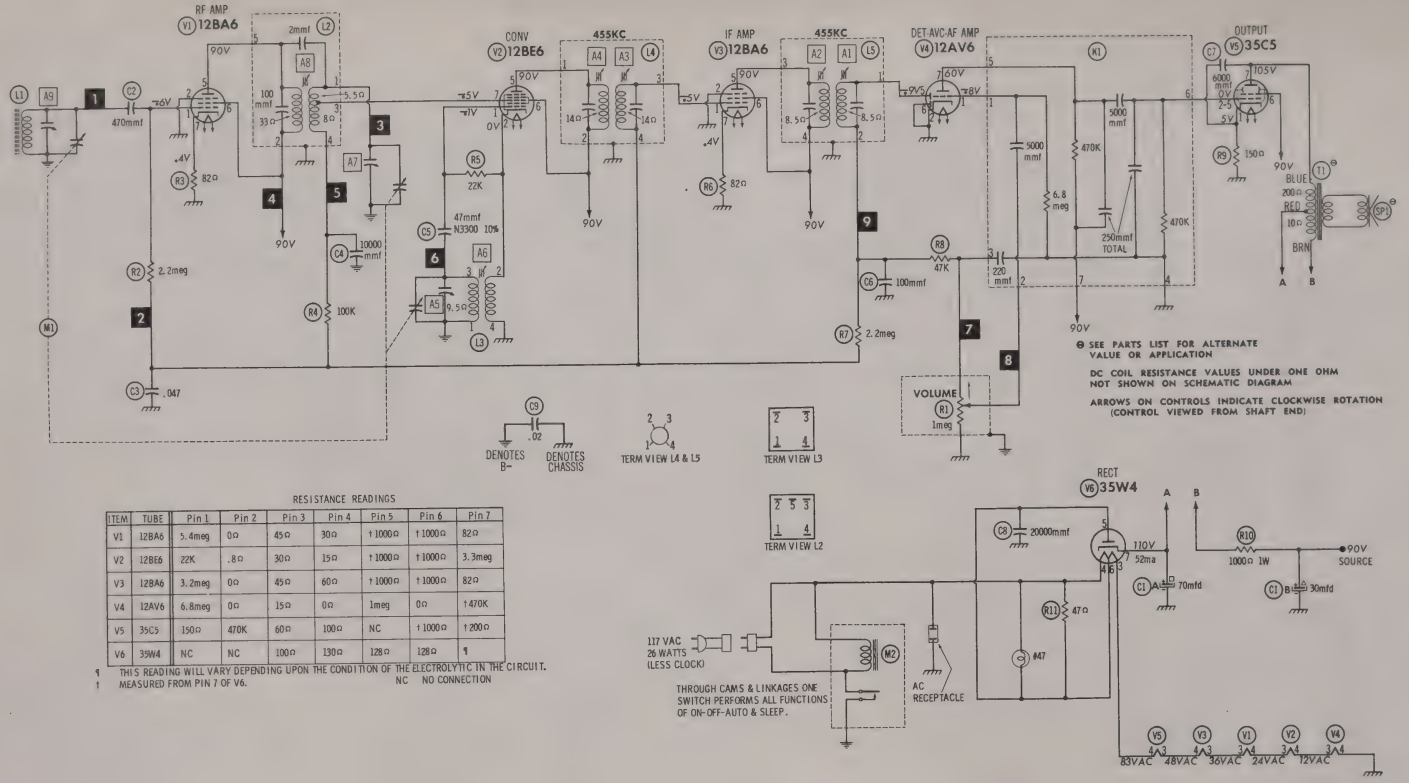
KG420

SET 526 FOLDER 9



Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BA6	5.4meg	0Ω	45Ω	30Ω	↑1000Ω	↑1000Ω	82Ω
V2	12BE6	22K	.8Ω	30Ω	15Ω	↑1000Ω	↑1000Ω	3.3meg
V3	12BA6	3.2meg	0Ω	45Ω	60Ω	↑1000Ω	↑1000Ω	82Ω
V4	12AV6	6.8meg	0Ω	15Ω	0Ω	1meg	0Ω	↑470K
V5	35C5	150Ω	470K	60Ω	100Ω	NC	↑1000Ω	↑200Ω
V6	35W4	NC	NC	100Ω	130Ω	128Ω	128Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
↑ MEASURED FROM PIN 7 OF V6.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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SILVERTONE MODELS
1039, 1040, 1041 (Ch. 528.54040)

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (◆ GENERAL ELECTRIC)	TYPE (◆ RAYTHEON)	TYPE (◆ SYLVANIA)
V1	RF Amplifier	12BA6		
V2	Converter	12BE6		
V3	IF Amplifier	12BA6		
V4	Det. -AVC-AF Amp.			12AV6
V5	Output			35C5
V6	Rectifier			35W4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■70	150	18-58-5	PWH2-17-50	XB0181 †	PFP214.3	TMD-2125 ♦	PCL-2441	
B	▲30	150							

† Use printed circuit adapters #55277 & 55278.
♦ Use printed circuit adapters TMAL & TMAS.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	EMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C3	.047 200V		P2151N-047	DD-503	BC2S47J	4DP-3-503	ACE-6147	2SE-S47
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5	47 N3300 10%	#15-479118			*			
C6	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C7	6000		DAC-22	DD16-602	HVE16D6	6DP-1-602	UAC-260	BL-D60
C8	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C9	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S20

Silvertone Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	24-426-0	B-70	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	REPLACEMENT DATA WORKMAN TV PART No.	REMARKS
R2	2.2meg			
R3	82Ω			
R4	100K			
R5	22K			
R6	82Ω			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	REPLACEMENT DATA WORKMAN TV PART No.	REMARKS
R7	2.2meg			
R8	47K			
R9	150Ω			
R10	1000Ω 1W			
R11	47Ω			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
K1	Audio Coupling	220mmf, 250mmf, 5000mmf, 5000mmf, 470K, 470K, 6.8meg	13-32-3	Aerovox PA-512-3 Centralab PC-158 Sprague DT-5

PRINTED BOARD

A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

OPERATION

"Snooze-Alarm"

To repeat alarm, press "Snooze-Alarm" button once; alarm will shut off for 10 minutes. Press button twice to shut off alarm for 30 minutes, 3 times for 45 minutes and 4 times for 60 minutes. Pressing the alarm button 5 times shuts off the receiver.

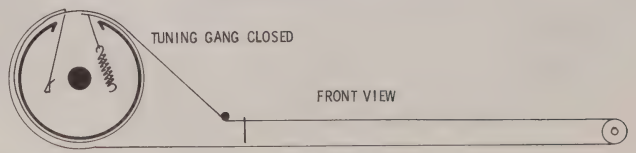
Automatic Shut-off

For 10 minute operation of receiver, press alarm button once, for 30 minute operation, press twice; for 45 minutes press 3 times, and for 60 minutes press 4 times. Pressing the button 5 times shuts off the receiver.

Note

The receiver will continue to operate once the alarm button is pressed even when the off button is pressed. To shut off the receiver in this situation, press the alarm button several times.

DIAL CORD STRINGING



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		SILVERTONE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1	Loopstick	82-174-0	BC-419	2004		
L2	RF	10-26-0				
L3	Osc.	10-56-4				
L4	Input IF	10-84-2	BC-356	13-PC1	RTC-8641	
L5	Output IF	10-74-2	BC-357	13-PC2	RTC-8642	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	SILVERTONE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2700Ω Tap @ 5%	3-4Ω	B80-107-1A ①	A-3031	A-3336	24S87		① Alternate Part #80-107-1.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	5"	PM	3-4Ω	33-421-4 *	5A07	* Includes T1.

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1	Tuning Cap.	19-36-3	3 Gang
M2	Clock Ass'y.	84-11512	Includes Mounting Brackets
	Printed Board	84-11506-0	Assembly Complete, Less Tubes
	Printed Board	25-32-1	Board Only, Less All Components

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

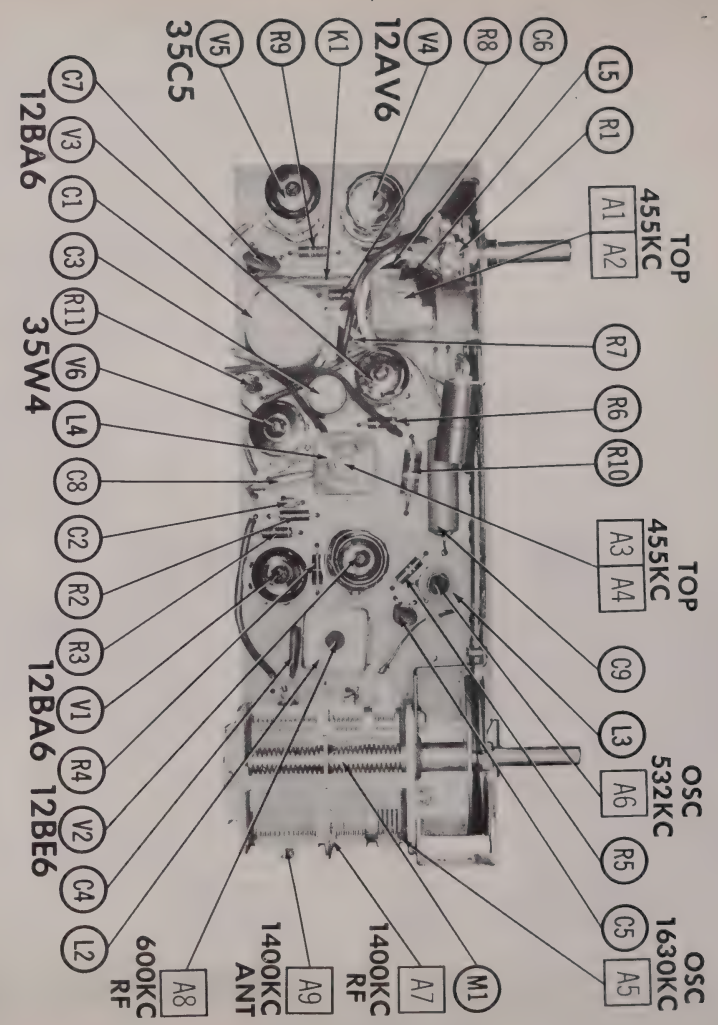
NAME	PART NO.	DESCRIPTION
Knob	52-1380-0	
Dial Scale	67-681-0	
Dial Pointer	52-236-1	
Cabinet Front	40-74-1	
Cabinet Rear	42-125-1	Brown, Model 1039
Cabinet Rear	42-126-1	Ivory, Model 1040
Cabinet Rear	42-127-1	Pink, Model 1041

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

SUDFUNK
MODEL K986A

SUDFUNK
MODEL K986A

SUDFUNK
MODEL K986A

TRADE NAME	Sudfunk Model K986A		
IMPORTER	Delmonico International, Div. of Thompson Starrett Co., Inc., 120-20 Roosevelt Ave., Corona 68, N. Y.		
TYPE SET	Battery Operated Transistorized Portable FM-AM Receiver		
POWER SUPPLY	6 Volts DC	RATING	15MA @ 6 Volts DC (No Signal, Min. Volume) 25MA @ 6 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	540 — 1600KC	FREQ. MOD.	88 — 108MC

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EIA

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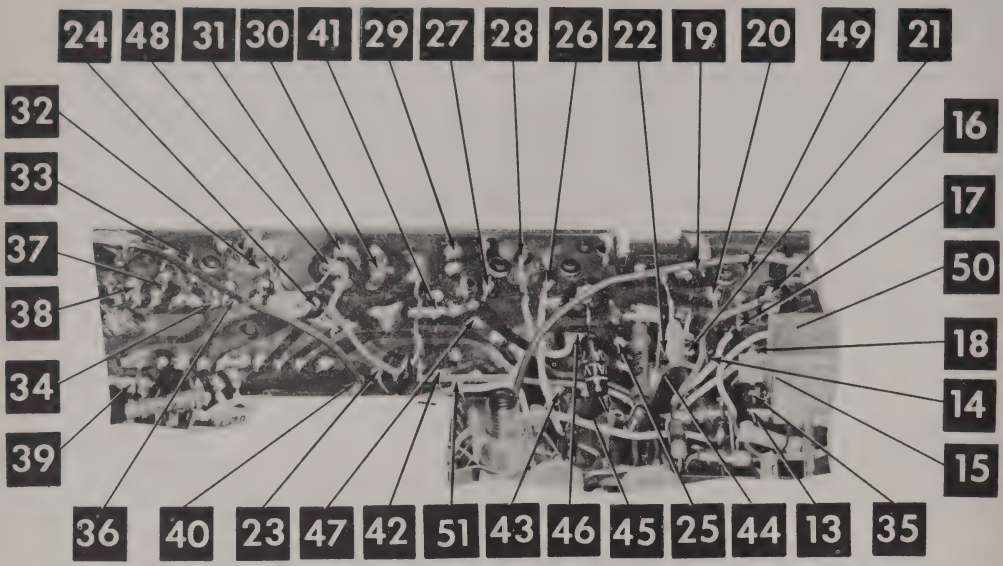
KK330

SET 526 FOLDER 10



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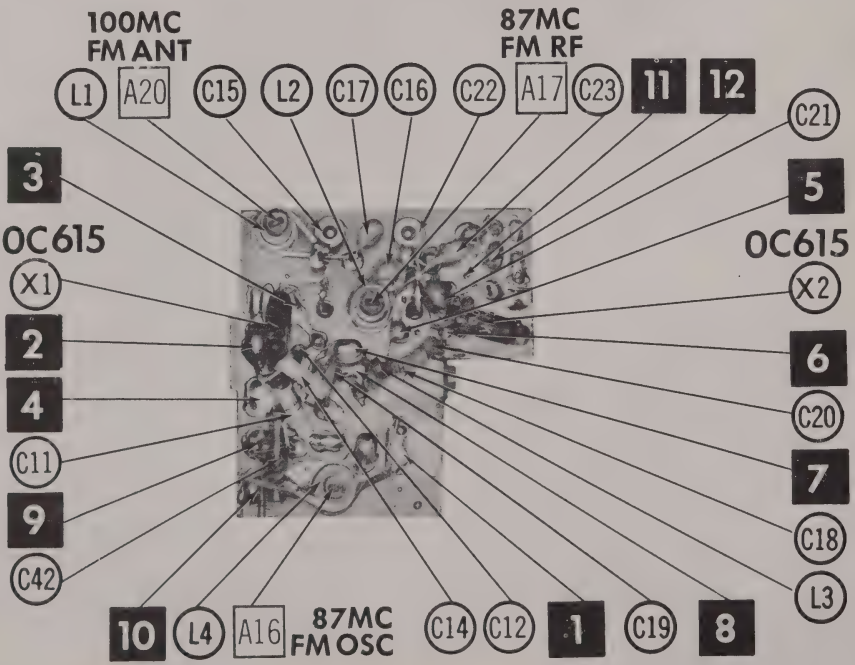
PRINTED BOARD



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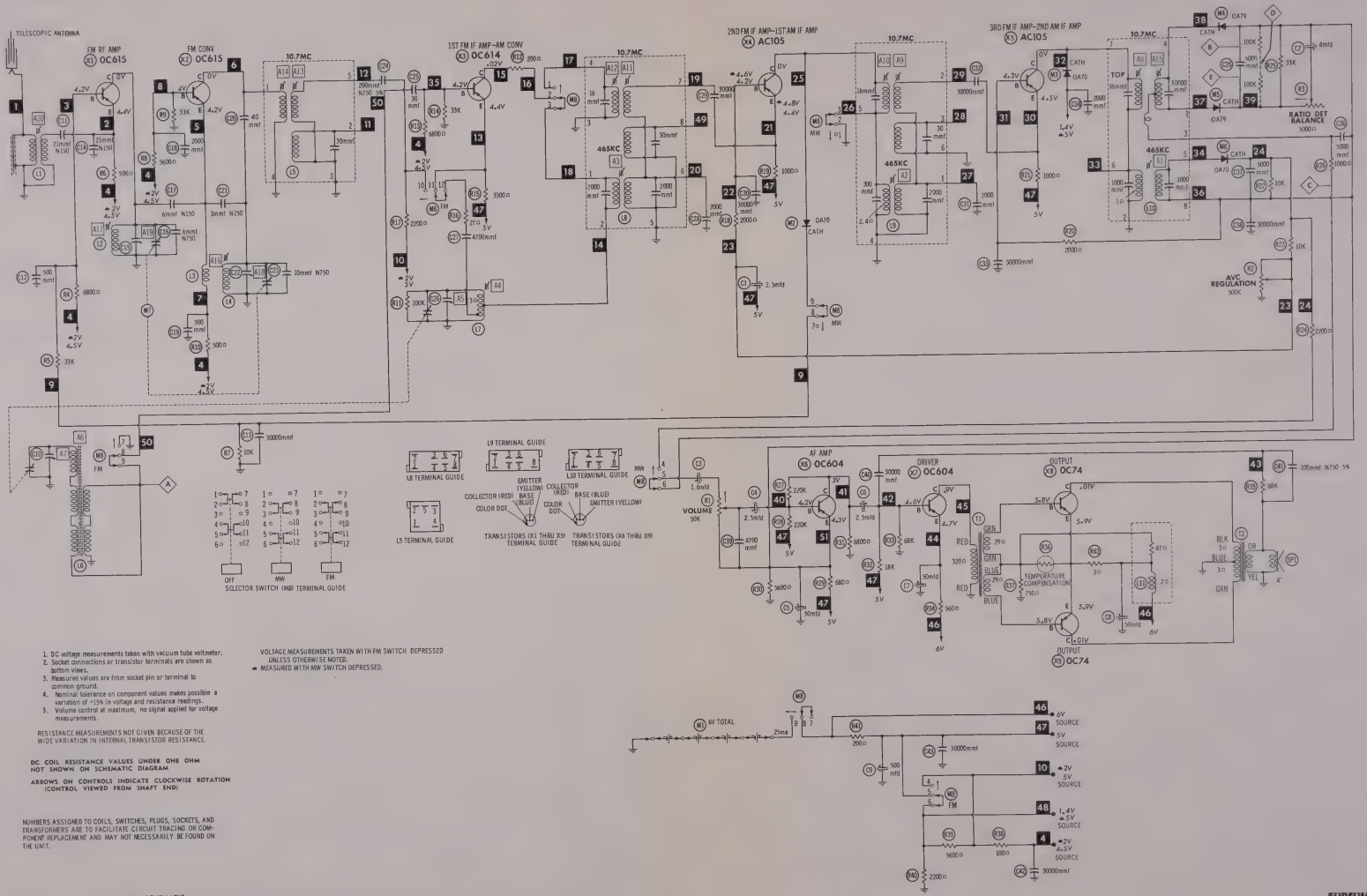

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

VOLTAGE MEASUREMENTS TAKEN WITH FM SWITCH DEPRESSED UNLESS OTHERWISE NOTED.

▰ MEASURED WITH MW SWITCH DEPRESSED.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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SUDFUNK MODEL K986A

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1 thru A4, A8 thru A15.. GENERAL CEMENT #9440
A5, A7..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528
A16, A17, A20..... GENERAL CEMENT #8282, 8606, 8606-L, 9091
WALSCO #2526, 2541, 2542, 2543, 2544
A18, A19..... GENERAL CEMENT #8721, 8722
WALSCO #2519

AM ALIGNMENT – SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to point (A). Low side to chassis.	465KC (400~ Mod.)	(AM) Tuning gang fully open.	Across voice coil.	A1, A2, A3	Adjust for maximum output.
2.	"	500KC	500KC	"	A4	"
3.	"	1650KC	1650KC	"	A5	Adjust for maximum output. Repeat Steps 2 and 3.
4.	Loop	650KC	650KC	"	A6	Adjust for maximum output.
5.	"	1600KC	1600KC	"	A7	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM–SELECTOR IN FM POSITION

Connect two matched 100K (±1%) resistors in series from point (B) to point (E). The junction of these two resistors is alignment point (D) as shown on the schematic.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	High side thru .001mfd to FM antenna. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point (B). Common to point (E).	A8, A9, A10, A11, A12, A13, A14	Adjust for maximum deflection.
7.	"	"	"	DC probe to point (C). Common to point (D).	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE–SELECTOR IN FM POSITION

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	High side thru .001mfd to FM antenna. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point (B). Low side to point (E).	A8, A9, A10, A11, A12, A13, A14	Disconnect Stabilizing Capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C2.
7.	"	"	"	Vert. amp. to point (C). Low side to chassis.	A15	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT – SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	High side thru .001mfd to FM antenna. Low side to chassis.	87MC (Unmod.)	(FM) Tuning gang fully closed.	DC probe to point (B). Common to point (E).	A16, A17	Adjust for maximum deflection.
9.	"	108MC	Tuning gang fully open.	"	A18, A19	"
10.	"	100MC	100MC	"	A20	"

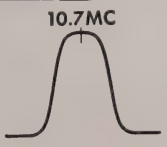


FIG. 1

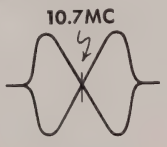
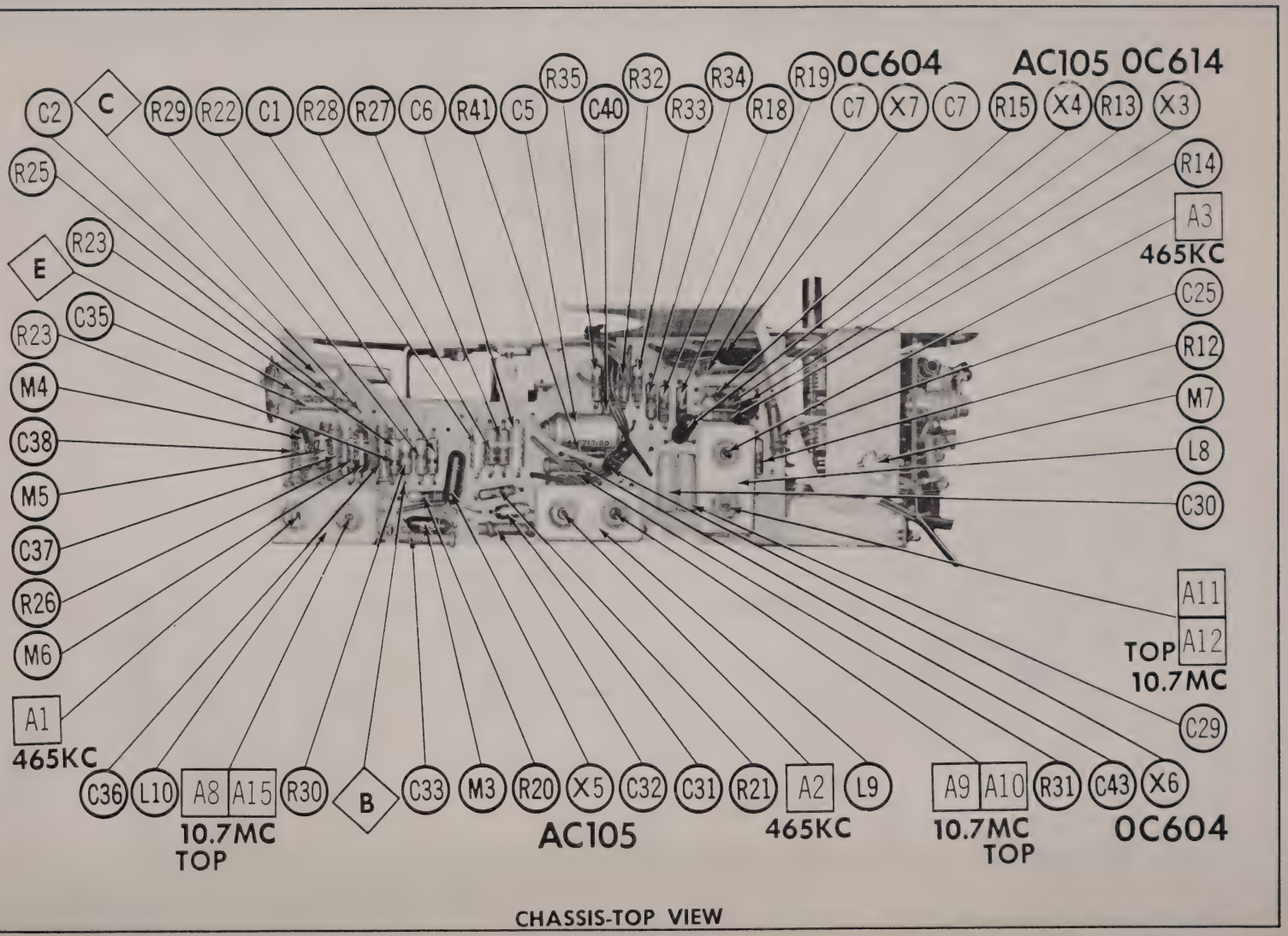


FIG. 2



CHASSIS-TOP VIEW

CHASSIS—BOTTOM VIEW

POWER CHASSIS

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	OC615	FM RF Amplifier				PNP
X2	OC615	FM Converter				PNP
X3	OC614	1st FM IF Amp. -AM Conv.				PNP
X4	AC105	2nd FM-1st AM IF Amp.				PNP
X5	AC105	3rd FM-2nd AM IF Amp.				PNP
X6	OC604	AF Amplifier				PNP
X7	OC604	Driver				PNP
X8	OC74	Output				PNP
X9	OC74	Output				PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		SUDFUNK PART No.	REPLACEMENT DATA					NOTES
	CAP.	VOLT.		AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	2.5	25		PTT-25003	NLW3-25	TC302	MLV2-50	TE-1150	
C2	4	10		XPP-10004	NLW4-15	TT50X4	MLV5-12	TE-1123	
C3	1.6	12.5		XPP-15002	NLW2-50	TT12X2	MLV2-50	TE-1149	
C4	2.5	25		PTT-25003	NLW3-25	TC302	MLV2-50	TE-1150	
C5	50	12.5		XPP-15050	NLW50-15	TT15X50	ML50-15	TE-1160	
C6	2.5	25		PTT-25003	NLW3-25	TC302	MLV2-50	TE-1150	
C7	50	12.5		XPP-15050	NLW50-15	TT15X50	ML50-15	TE-1160	
C8	50	12.5		XPP-15050	NLW50-15	TT15X50	ML50-15	TE-1160	
C9	500	12		PRS1170	BR5001	TC1505	TD-500-15	TVA-1162	

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10						*		10TCP-Q22
C11	21 N150							
C12	500		DI-500	DD-501	BYA10T5	CCD-501	B-350	10TS-T50
C13	30000		SI 30000	DD-303	BYB6S3	CCD-303	GP130	5HK-S30
C14	21 N150					*		10TCP-Q22
C15					C10V6U			
C16	6 N750					*		
C17	6 N150							
C18	2000		SI 2000	D6-202	BYA10D2	CCD-202	B-220	5HK-D20
C19	500		DI-500	DD-501	BYA10T5	CCD-501	B-350	10TS-T50
C20	40		SI 39	D6-400	L10Q39	CCD-390	GP439	10TS-Q39
C21	3 N150					*		
C22								
C23	10 N750		N750-DI 10	DTN-10	C10Q1U	CCTN-100	CN7-410	10TCU-C10
C24	200 N750 5%			TCN-200	C10T2U		CN7-320	10TCU-T20
C25	30		SI 30	D6-330	L10A3	CCD-300	GP430	10TS-Q30
C26								
C27	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C28	2000	Note 1	BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C29	30000		SI 30000	DD-303	BYB6S3	CCD-303	GP130	5HK-S30
C30	30000		SI 30000	DD-303	BYB6S3	CCD-303	GP130	5HK-S30
C31	2000	Note 1	SI 2000	D6-202	BYA10D2	CCD-202	B-220	5HK-D20
C32	30000		SI 30000	DD-303	BYB6S3	CCD-303	GP130	5HK-S30
C33	30000		SI 30000	DD-303	BYB6S3	CCD-303	GP130	5HK-S30
C34	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C35	5000		SI 5000	D6-502	BYA10D5	CCD-502	B-250	5HK-D50
C36	5000		SI 5000	D6-502	BYA10D5	CCD-502	B-250	5HK-D50
C37	5000		SI 5000	D6-502	BYA10D5	CCD-502	B-250	5HK-D50
C38	30000	Note 1	SI 30000	DD-303	BYB6S3	CCD-303	GP130	5HK-S30
C39	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C40	30000		SI 30000	DD-303	BYB6S3	CCD-303	GP130	5HK-S30
C41	100 N750 5%			TCN-100	C10T1U		CN7-310	10TCU-T10
C42	30000		SI 30000	DD-303	BYB6S3	CCD-303	GP130	5HK-S30
C43	30000		SI 30000	DD-303	BYB6S3	CCD-303	GP130	5HK-S30

Note 1. Not used in some versions.

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SUDFUNK PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	50K			AB-32				Volume
B	Shaft			AK-29				
R2	500K							AVC Regulation
R3	5000Ω		①					Ratio Detector Balance. Note 1

① Not used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R4	6800Ω				R24	2200Ω			
R5	33K				R25	33K			
R6	500Ω				R26	1000Ω			
R7	10K				R27	220K			
R8	5600Ω				R28	220K			
R9	33K				R29	680Ω			
R10	500Ω				R30	5600Ω			
R11	100K				R31	6800Ω			
R12	200Ω				R32	18K			
R13	6800Ω				R33	68K			
R14	33K				R34	560Ω			
R15	3300Ω				R35	68K			
R16	27Ω				R36	TEMP. COMP.			
R17	2200Ω				R37	750Ω			
R18	2000Ω				R38	100Ω			
R19	1000Ω				R39	5600Ω			
R20	2000Ω				R40	2200Ω			
R21	1000Ω				R41	200Ω			
R22	10K				R42	2Ω			
R23	10K								

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		SUDFUNK PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1	FM Ant.					① Wound on 47Ω Resistor.
L2	FM RF					
L3	Emitter Choke					
L4	FM Osc.					
L5	1st FM IF					
L6	Loopstick					
L7	AM Osc.					
L8A	2nd FM IF					
B	1st AM IF					
L9A	3rd FM IF					
B	2nd AM IF					
L10A	Ratio Detector					
B	3rd AM IF					
L11	RF Choke	①				

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	SUDFUNK PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.5	1						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	SUDFUNK PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	80Ω CT	3-4Ω						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SUDFUNK PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω		4A15Z4	

BATTERIES

ITEM No.	VOLTAGE	SUDFUNK PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1½V			230 *		A100 *		M-13R *	* 4 Required

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		SUDFUNK PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	OA70			1N60	1N60	Overload & AVC (Pigtail)
M3	OA70			1N60	1N60	Limiter (Pigtail)
M4	OA79			1N295	1N295	FM Detector
M5	OA79			1N295	1N295	FM Detector
M6	OA70			1N60	1N60	AM Detector

MISCELLANEOUS

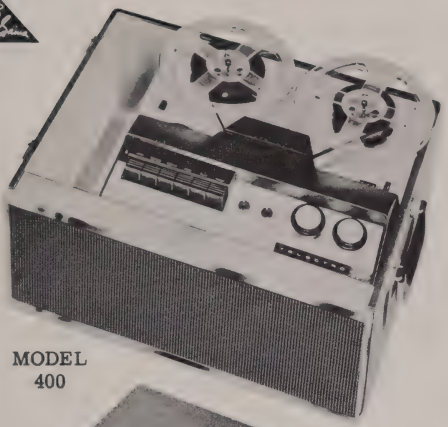
ITEM No.	PART NAME	SUDFUNK PART No.	NOTES
M7	Tuning Cap.		4 Gang (FM-AM)
M8A	Switch		FM (Pushbutton Type) 3 Section
B	Switch		MW
C	Switch		Off

WIRING DATA

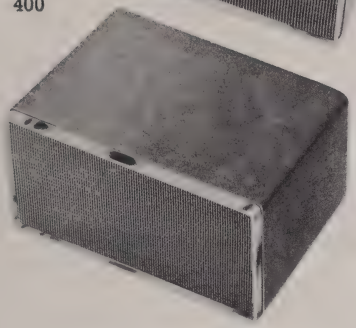
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder with CIRCUITRACE®



MODEL
400



MODEL
333

TELECTRO MODELS
333, 400

TELECTRO MODELS
333, 400

GENERAL INFORMATION

Telectro Models 333 and 400 are three-speed tape recorders and can play back both monaural and stereophonic recordings.

Model 333 will record and play back monaural and play back stereo. Model 400 will record and play back stereo. Recordings can be made from a microphone, radio, phonograph, tuner or TV set. An external speaker must be used to play back stereo recordings.

These models have three tape speeds, 7 1/2, 3 3/4 and 1 7/8 ips. A two-position equalization switch for 7 1/2 ips and 3 3/4 or 1 7/8 is provided. Using both tracks, recording times are as follow:

Tape Length	7 1/2 ips.	3 3/4ips.	1 7/8 ips.
1200 ft.	1 hour	2 hours	4 hours
1800 ft.	1 1/2 hours	3 hours	6 hours
2400 ft.	2 hours	4 hours	8 hours

These recorders operate on 60 cycles, 105-120 volts AC only.

Manufactured By:

Telectrosonic Corporation
35--18 37th Street
Long Island City 1, New York

SET 526 FOLDER 11

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

CQ444

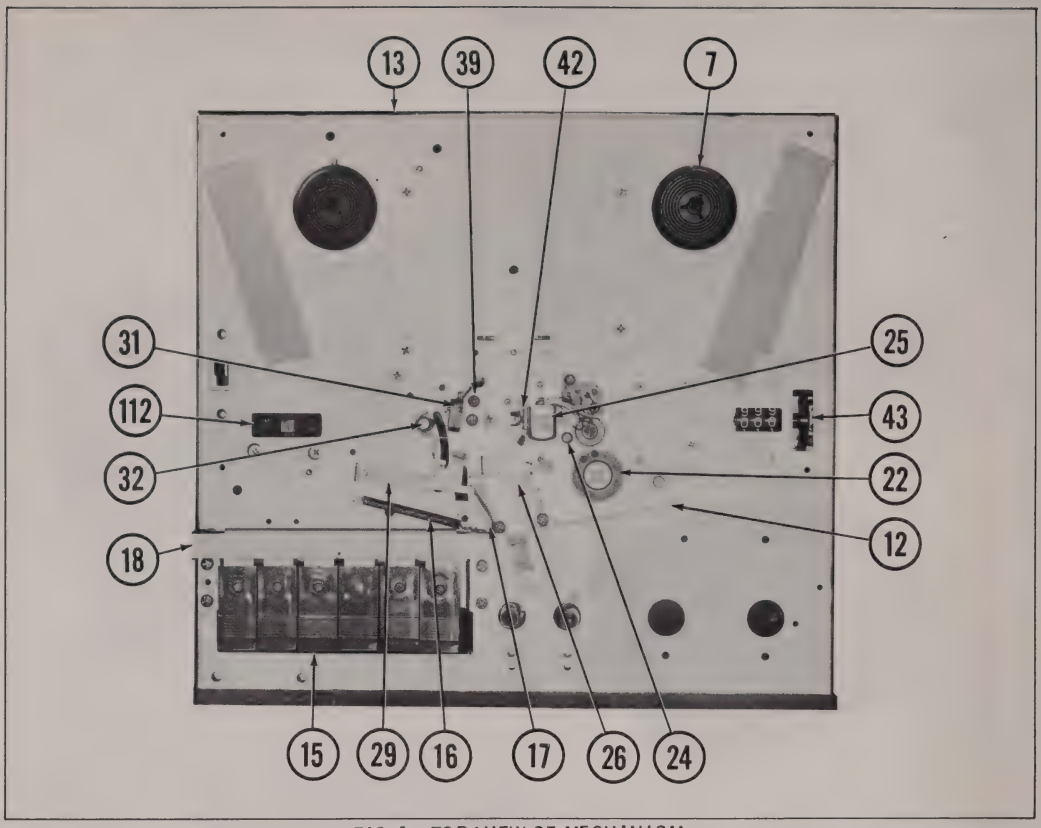


FIG. 1 TOP VIEW OF MECHANISM

FUNCTION OF CONTROLS

Power On-Off, Volume Control #1

Turns power on and off for entire unit. Regulates volume on monaural playback. Determines recording level. Controls first-channel volume on stereo playback on Model 333 and regulates the record level and playback for the first channel stereo on Model 400.

Volume Control #2

On Model 333, it controls the volume for stereo playback only. On Model 400, it controls the record level and volume for stereo recording and playback.

Tone Control #1

Controls bass and treble response on monaural playback; first channel tone on stereo playback. It does not function during record.

Tone Control #2

Functions on second channel stereo playback only.

Rotary Speed Selector

Selects desired tape speed: 7 1/2, 3 3/4, or 1 7/8 ips. This control cannot be turned unless the pushbuttons are in the Stop position.

Equalization Switch

In up position, it equalizes response for 7 1/2 ips speed and down position for 3 3/4 and 1 7/8 ips speeds.

FUNCTION OF PUSHBUTTONS

In order for the pushbuttons to work properly, they should be depressed firmly. All buttons lock into position when depressed except stop and pause. The recorder can be changed from one function to another

immediately except from wind and rewind to play; in this case, the stop button must first be depressed.

Stop

Applies brake to both spindles and returns all pushbuttons to neutral.

Record

Moves play-record switch into record position.

Rewind

Returns tape rapidly to supply reel. Moves wind-rewind pulley, increasing tension on rewind belt which turns supply spindle.

Wind

Moves tape rapidly in play and record direction. Moves wind-rewind pulley, increasing tension on wind belt which turns takeup spindle.

Play

Moves tape for playback (or recording, if Record button is depressed simultaneously). Brings pressure roller and pressure pads into position against capstan and record head.

Pause

Stops tape by removing pressure roller from capstan and applying the brake to the spindles. Record or playback settings are not disturbed.

On-Off Monitor

Turns speaker on or off for monitoring during recording.

INPUT AND OUTPUT JACKS

External Speakers 1 and 2

Used when connecting external speakers for playback. Speaker 1 jack is used for monaural playback; when a speaker is plugged in, it disconnects the internal speaker of the recorder. Speaker 2 jack is used for channel two on stereo playback with the internal speaker of the recorder or with an external system plugged into speaker jack 1.

Stereo Phono 1 and 2

Used for connecting phono outputs to recorder for recording stereophonic records.

Microphone Low Level

Plug microphone into this jack for microphone recordings.

Radio Phono

A high level input used when recording from radio, phonograph, tuner, etc., by means of a patch cord.

OPERATING INSTRUCTIONS

Threading the Tape

Place reel of tape on left spindle; empty reel on right spindle. Thread tape in slot with shiny side toward the front of recorder. Insert loose end of tape into one of the slots in the empty reel and turn reel counterclockwise to take up slack in the tape.

To Make Recording

Plug the microphone into the Low Level input jack. Set the rotary Speed Selector to the desired speed. Turn on the power by rotating On-Off Volume control #1 clockwise until a click is heard. Allow sufficient time for the tubes to warm up. Depress the Record button and adjust Volume control #1 so the level light will flicker on the loudest passage. Hold the Record button down and depress the Play button until both are locked in the down position. If both buttons will not stay down or a buzzing noise is heard, the tape is not properly threaded. Depress the Stop button at the end of a recording; at the end of the tape, the recorder will stop automatically.

Hold the microphone approximately eight inches from the mouth when recording voice. Place the microphone two or three feet in front of the loudspeaker when recording from a radio, phonograph, or TV set.

Hold the Pause button down to interrupt a recording briefly. The recorder will continue to record when the Pause button is released.

These models are dual-track recorders. The top half of the tape is used during a recording. After the entire reel is recorded, the full reel is removed from the takeup spindle, turned over, and placed on the supply spindle. After threading the tape, a new recording can be made. This doubles the playing and recording time of a reel of tape.

It is possible to record directly from a radio, phonograph, tuner, or TV set by connecting a patch cord between the High Level jack and the desired instrument.

To Wind or Rewind Tape

Depress the Wind or Rewind button to move the tape in the desired direction. Depress the Stop button to stop the tape. The recorder will stop automatically at the end of the reel.

To Play Monaural Recordings

Thread the tape as described under "Threading the Tape". Depress the Play button. Adjust Volume and Tone controls #1. Volume and Tone controls #2 should be turned fully counterclockwise.

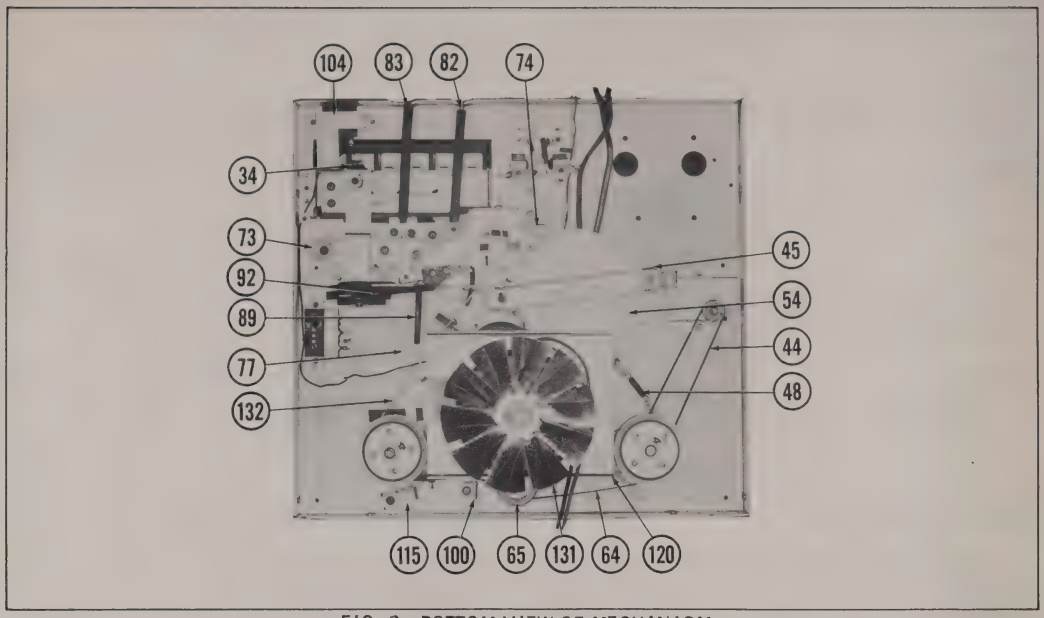


FIG. 2 BOTTOM VIEW OF MECHANISM

To Play Stereophonic Tapes

A second speaker system is required to play stereo tapes. Plug the second speaker system into External speaker jack 2. Adjust Volume and Tone controls #1 for the first channel and Volume and Tone controls #2 for the second channel.

To Make a Stereophonic Recording - Model 400

Plug one microphone into the Low Level input jack #1, and another microphone into Low Level input jack #2. Rotate the On-Off Volume control #1 clockwise until a click is heard to turn the power on. Adjust Volume control #1 and Volume control #2 so the Level lights will flicker on the loudest passage of sound. Hold Record button down and depress the Play button until both are locked into position. If both buttons will not stay down or a buzzing noise is heard, the tape is not properly threaded.

Hold the microphone approximately eight inches from the mouth when recording voice and two or three feet from the loud-speaker when recording from a radio, phonograph, or TV set.

Hold the Pause button down to interrupt a recording briefly. The recorder will continue to record when the pause button is released.

To Edit and Splice Tape

Since one track cannot be spliced without affecting the other, recordings to be edited should be limited to one-track tapes. Unwanted portions can be cut out and the desired selections joined together. Tape should be cut at a slight diagonal and the ends joined together with splicing tape on the glossy side. Excess splicing tape should be trimmed from the sides of the tape.

NOTE: Use splicing tape only. Do not use regular cellophane tape.

To Use as a Public Address System

Plug the microphone into Stereo Phono 1 jack. The internal speaker of the recorder can be used or an external system can be plugged into External speaker 1 jack. Do not point the speaker toward the microphone, because this will cause feedback which will produce howl.

Head Lifter

Push left lever of head lifter down for four-track recordings, and right lever down for two-track recordings.

DISASSEMBLY

To Remove Recorder From Case

1. Remove escutcheon from input and output jacks.
2. Remove four screws from bottom of case and four bolts from side.
3. Set case on side with speaker down and slide mechanism forward.
4. Unsolder speaker leads.
5. Reverse foregoing procedure to reassemble.

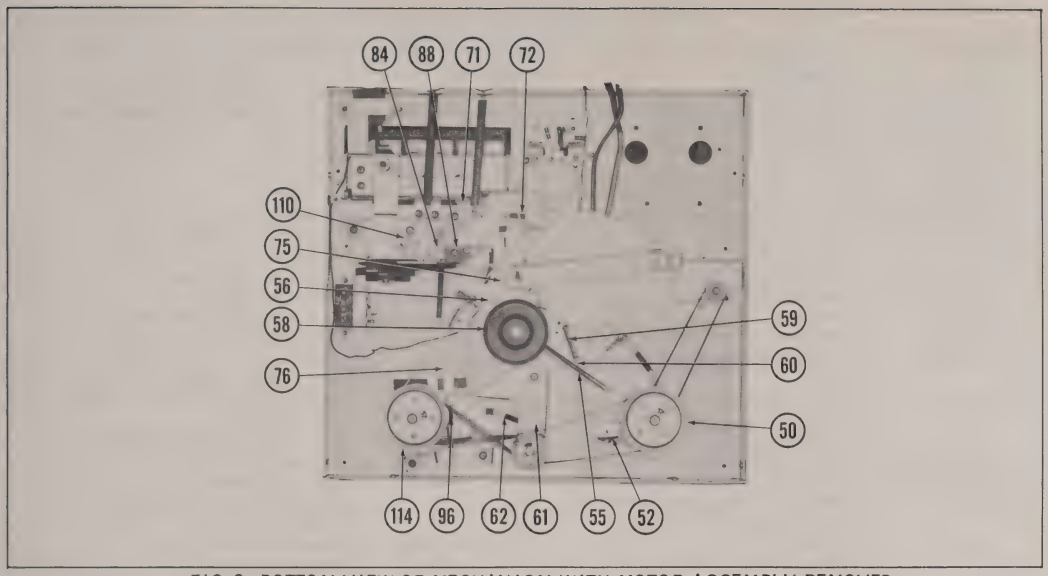


FIG.3 BOTTOM VIEW OF MECHANISM WITH MOTOR ASSEMBLY REMOVED

ADJUSTMENTS

To Align Erase Head

Loosen mounting nuts and set erase head so that top of head gap is even with top of tape. Tighten mounting nuts.

To Align Record-Playback Head

1. Put head in up position by pushing down on left tab of head mounting bracket assembly (42).
2. Loosen mounting nuts at side of head mounting bracket assembly (42). Set top of upper gap evenly with top of tape. Tighten mounting nuts.
3. Adjust for maximum output by turning alignment screw, on right side of mounting bracket, while playing a prerecorded alignment tape.
4. Repeat steps 2 and 3.

CLEANING

Pressure roller (22), capstan, and recording head (25) should be cleaned occasionally of dirt and foreign matter with a soft cloth moistened with alcohol.

LUBRICATION

These recorders do not require lubrication under normal use. When disassembled for repair, wipe all bearings and sliding levers with a clean soft cloth and apply a thin coat of oil to their surfaces.

MECHANICAL PARTS LIST

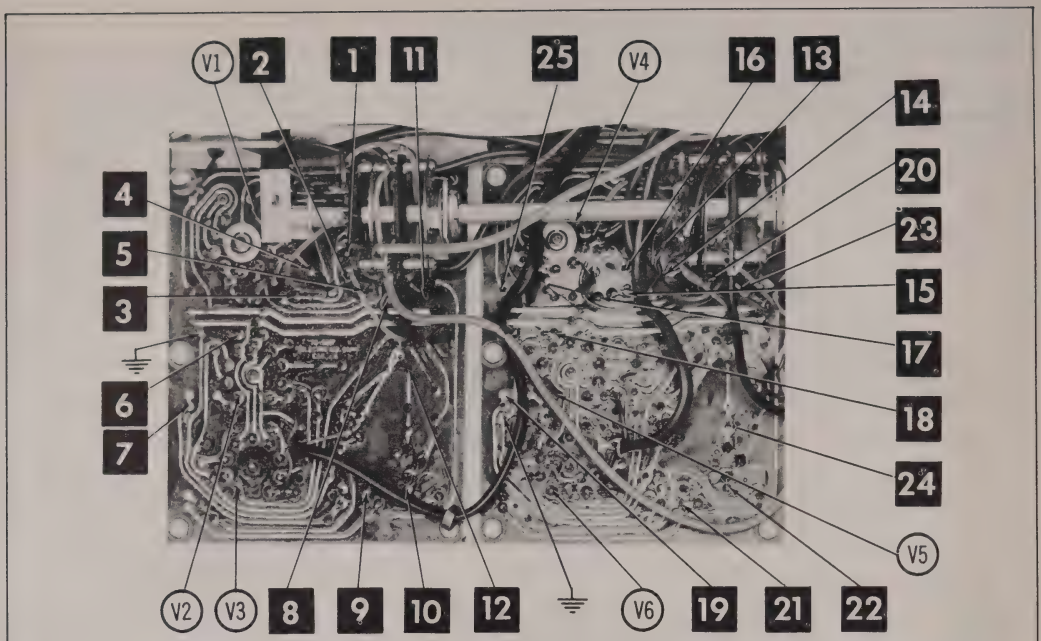
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	TA-1255	Volume Control Knob - Model 333	6		Escutcheon Screw, 6-32 x 7/8 Ph. Hd.
	TA-1255	Volume Control Knob - Model 400	7	TS-2152	Spindle
2	TK-246	Tone Control Knob - Model 333	8		Washers
	TK-246	Tone Control Knob - Model 400	9		Ball Race
3		Screw, 6-32 x 1/4 Phil. Truss. Hd.	10	5133-25	Retaining Ring
4	TP-1249	Dress Plate - Model 333	11		Washer .255 I.D. x 1/2 O.D. x .010 Thick Steel
	TP-1249	Dress Plate - Model 400	12	TA-1488	Pressure Roller Plate Ass'y.
5	TA-1480	Escutcheon - Model 333	13	TB-2151	Motor Board
	TA-1483	Escutcheon - Model 400	14	TE-276-3	Rear Escutcheon- Model 333

MECHANICAL PARTS LIST (CON'T.)

Ref. No.	Part No.	Description
14	TE-276-3	Rear Escutcheon-Model 400
15	TB-1010	Pushbutton-Model 333
	TB-1010	Pushbutton-Model 400
16	TS-1993	Erase Head Pressure Pad Spring
17	TS-1902	Record Head Pressure Pad Spring
18	TA-1349	Pushbutton Ass'y. Bracket
19	TS-1985	Pushbutton Spring
20	5133-25	Retaining Ring
21		Washer, .255 I.D. x $\frac{1}{2}$ O.D. x .010
22	TR-1846	Pressure Roller
23		Washer
24	TG-476	Right Tape Guide Post
25	TH-584	Record-Play Head 1/4 Track Stereo
26	TB-2130	Record Head Pressure Pad Brkt.
27		Screw, 6 x 3/8 Hex Sheet Metal Type Z
28	5133-12	Retaining Ring
29	TB-2137	Erase Head Pad Bracket
30	TB-1067	Pressure Roller Stop Plate Brkt.
31		Erase Head-Half Track - Model 333
		Erase Head - 1/4 Track - Model 400
32	TG-461	Left Tape Guide Post
33	TL-354-1	Stop Pushbutton Lever
34	TA-1560	Record Switch Lever
35	TL-354	Pushbutton Lever
36		Washer .203 I.D. x 3/8 O.D. x 1/32
37	TS-1986	Record Switch Spring
38	5133-18	Retaining Ring
39	TB-2152	Erase Head Bracket
40		Tape Guide Wire
41	TS-1984	Pushbutton Latch Spring
42	TB-2028	Record-Play Head Mtg. Brkt.
43	TC-1747	Counter Ass'y.
44	TR-1614	Counter Drive Belt
45	TA-1252	Flywheel Thrust Plate Ass'y.
46		No. 6 Lockwasher
47		Screw, 6-32 x $\frac{1}{2}$ Phil. Bdg.
48	TS-2085	Brake Cord Spring
49	TA-1183	Counter and Brake Pulley Ass'y.
50	265	Spindle Pulley for Drive Belt
51		Set Screw
52	TB-2180	Motor Mounting Bracket
53		Washer
54	TF-324	Flywheel
55	TS-1993-1	Idler Wheel Spring
56	TA-1174	Idler Arm Pivot Ass'y.
57		Fiber Washer
58	TW-424	Idler Wheel
59	TS-2041	Takeup Compression Spring
60	TA-1225	Idler Release Rod Assembly
61	TA-1163	Idler Pulley Arm Assembly
62	TS-1981	Wind Spring
63	TR-1548	Idler Drive Belt
64	TB-1018	Wind or Rewind Belt
65	TA-1489	Idler Pulley Assembly
66	TW-454	Fiber Thrust Washer
67	5133-25	Retaining Ring
68	TS-1988	Pause Linkage Spring
69	TS-2086	Swivel Head Lifter Shaft
70	TS-1911	Idler Elevation Shaft
71	TA-1176-1	Play Lever and Cam Ass'y.
72	TS-2244	Pressure Roller and Back Tension Spring
73	TA-1173-1	Brake Arm Assembly
74	TB-1050	Brake Cord Retainer Bracket
75	TA-1172	Idler Arm Support Speed Change Assembly
76	TR-1615	Push Rod
77	TR-1615	Push Rod
78		Washer
79	5133-25	Retaining Ring
80	TR-1416	Switch Cam Roller
81	5133-12	Retaining Ring
82	TS-2245	Cam Lever Spring
83	TS-1990	Brake Spring
84	TA-1169	Automatic Stop Actuator
85		Washer, 6 x 3/8 x 1/32 Fl. Steel
86		No. 6 Lockwasher
87		Screw, 6-32 x 3/8 Phil. Bdg. Hd. Mach.
88	TA-1170-1	Automatic Shutoff Bracket Ass'y.
89	TS-1993	Automatic Stop Spring
90	5133-12	Retaining Ring
91		Speed Selector Lift Lever (Part of Item 111)
92	TS-1980	Speed Selector Spring
93	5133-18	Retaining Ring
94		Washer, .192 I.D. x 3/8 O.D. x .010 Thick
95		Fiber Washer
96	TS-1981	Rewind Spring
97		Washer, No. 6 I.D. x 7/16
98		Screw, 6 x 3/8 Hex. Sheet Metal Type Z
99		Washer, .225 I.D. x $\frac{1}{2}$ O.D. x .010 Thick
100	TL-346	Wind Spring Link
101		Fiber Washer
102		Washer, .225 I.D. x $\frac{1}{2}$ O.D. x .010 Thick
103	5133-25	Retaining Ring
104	TL-361	Solenoid Arm Lever
105		Lockwasher
106		Screw
107		Steel Washer
108	5133-25	Retaining Ring
109	TS-2170	Speed Selector Locking Plate Spacer
110	TP-1008	Speed Selector Locking Plate
111	TA-1251	Speed Selector Bracket Ass'y.
112	TC-1741	Speed Selector Wheel
113	TA-1164	Brake Pulley
114	265	Spindle Pulley for Drive Belt
115	TL-367	Rewind Spring Link
116		Hex Nut
117		No. 6 Lockwasher
118		Washer, 6 x 7/16 O.D. x 1/32 Thk.
119		Washer
120	TP-1003-1	Motor Mounting Plate
121	TG-475	Grommet
122	TS-1942	Motor Mounting Spacer
123		Washer, 6 x 7/16 O.D. x 1/32 Thick
124	TA-1462	Motor and Pulley Ass'y.
125		Motor Pulley (Part of Item 124)
126	5133-18	Retaining Ring
127		Washer
128		Spring Washer
129		Fiber Washer
130		Felt Washer, 3/16 I.D. x 11/16 O.D. x 1/16 Thick
131	TF-339	Fan
132	TB-1093	Brake Cord, Dacron 24" Long

TROUBLE CHART

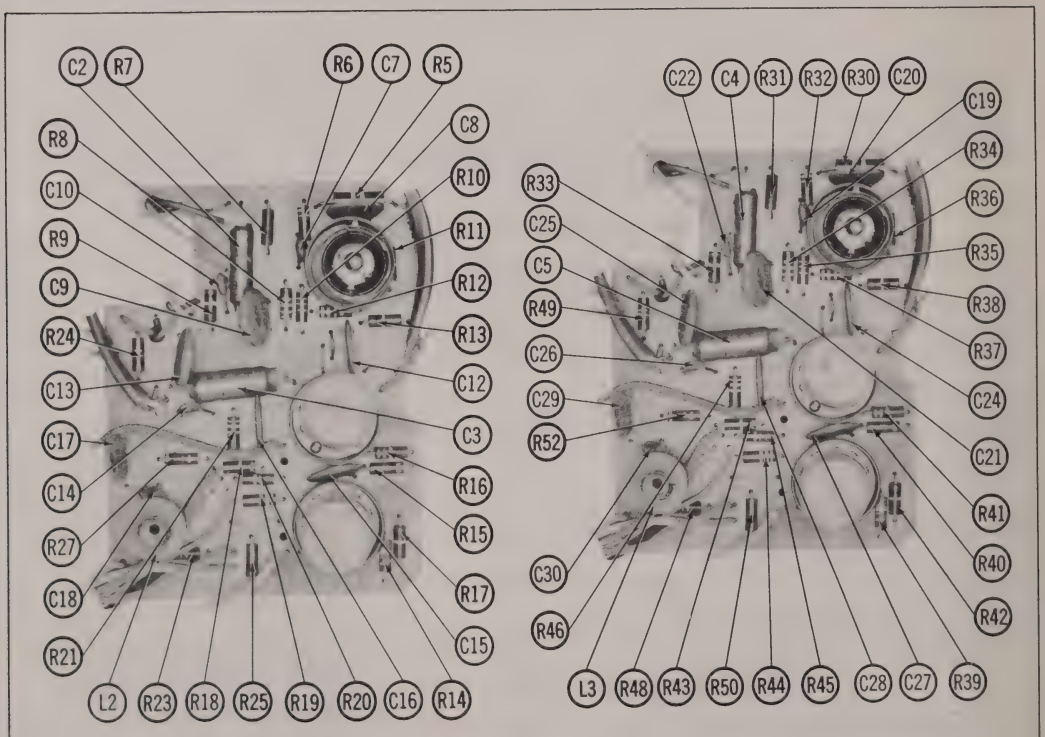
Symptom	Cause	Remedy
Tape fails to move when Play button is depressed.	1. Worn or dirty pressure roller (22). 2. Supply spindle binds. 3. Not enough pressure to hold pressure roller (22) against flywheel (54). 4. Idler wheel spring (55) weak or missing. 5. Posts of idler arm pivot (56) rusted or plate bent.	1. Clean or replace pressure roller (22). 2. Clean supply spindle or loosen brake cord. 3. Increase tension of back tension spring (72). Pressure should be 16-24 oz. 4. Replace idler wheel spring (55). 5. Clean posts or straighten plate.
Tape fails to move when Wind or Rewind button is depressed.	1. Idler drive belt (63) slipping or missing. 2. Brakes (132) too tight. 3. Wind or rewind belts (64) broken or too tight. 4. Idler pulley ass'y. (65) binding.	1. Clean or replace idler drive belt (63). 2. Loosen brake cord (132) from the motor mounting stud side. 3. Replace wind or rewind belt (64). Idler pulley arm (61) should have 1/16" ± 1/32" travel from left to right in idle position without stretching the belts. 4. Remove idler pulley (65), clean shaft on arm idler pulley ass'y., oil, and replace pulley.
Variation in speed after recorder has been in operation.	1. Pressure roller (22) too tight against flywheel (54). 2. Oil or dirt on flywheel (54), idler wheel (58), idler pulley (65), or motor pulley (125). 3. Wind-Rewind belts (64) too short. 4. Pressure pad springs (16) and (17) too tight.	1. Adjust as mentioned in remedy 3 of first symptom. 2. Clean surfaces of these parts with an industrial cleaner. 3. Adjust idler pulley arm (61) as mentioned in remedy 3 of preceding symptom. 4. Loosen springs by bending anchor back.
No speed change.	1. Speed change bracket (111) arm has jumped out of groove of idler arm (75). 2. Speed sliding post gummed up or corroded. 3. Support bracket of idler arm (75) jumped to left of play lever and cam bracket (71).	1. Reposition speed change bracket (111) arm in groove. Tighten lever retainer spring (92). Straighten speed change bracket (111). 2. Clean or replace sliding post and apply a thin film of oil. 3. Bend support bracket (75) down so it will clear top of play lever and cam bracket (71).
Automatic stop does not function.	1. Automatic stop switch out of position.	1. Adjust automatic stop switch so it trips when arm passes line of travel.
Automatic stop does not function.	1. Solenoid arm (104) too far from solenoid.	1. Bend solenoid arm (104) so that there is no more than 1/8" clearance between solenoid arm (104) and solenoid.
Incomplete Erase	1. Dirty erase head (31). 2. Defective electrical components.	1. Clean erase head (31) with soft cloth and alcohol. 2. Check voltages and resistances. Replace defective part.
Recording weak or distorted.	1. Dirty record-playback head (25). 2. Defective electrical components.	1. Clean record-playback head (25) with a soft cloth and alcohol. 2. Check voltages and resistances. Replace defective part.



A Howard W. Sams CIRCUITRACE Photo

PRINTED BOARD—MODEL 400

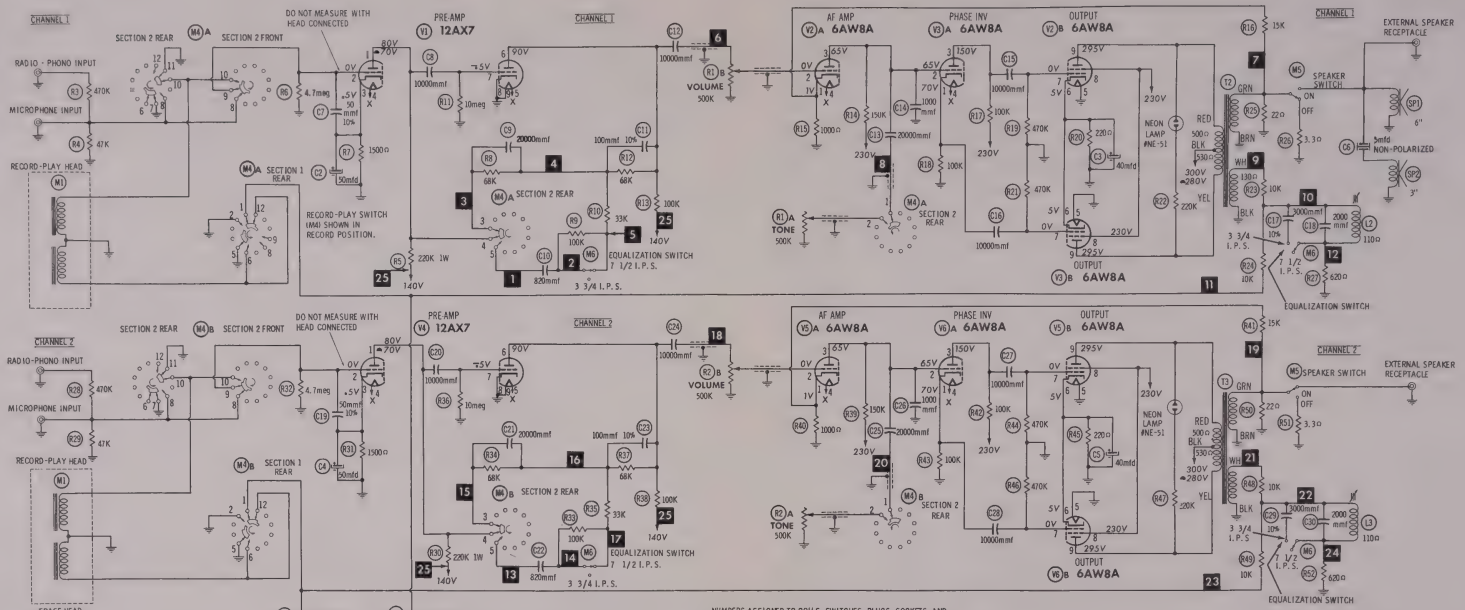
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



CHANNEL 1

PRINTED BOARDS—MODEL 400

CHANNEL 2


CHANNEL 1
SECTION 2 REAR
SECTION 2 FRONT
DO NOT MEASURE WITH HEAD CONNECTED
PRE-AMP V1 12AX7
CHANNEL 1
AF AMP V2A 6AW8A
PHASE INV V3A 6AW8A
OUTPUT V2B 6AW8A
CHANNEL 1
EXTERNAL SPEAKER RECEPTACLE
RADIO - PHONO INPUT
MICROPHONE INPUT
RECORD-PLAY HEAD
SECTION 1 REAR
RECORD-PLAY SWITCH (NAI SHOWN IN RECORD POSITION.
VOLUME 500K
TONE 500K
SPEAKER SWITCH
EQUALIZATION SWITCH
3 3/4 I.P.S.
7 1/2 I.P.S.
OUTPUT V3B 6AW8A
NEON LAMP #NE-51
CHANNEL 2
PRE-AMP V4 12AX7
AF AMP V5A 6AW8A
PHASE INV V6A 6AW8A
OUTPUT V5B 6AW8A
OUTPUT V6B 6AW8A
ERASE HEAD
BIAS OSC V7A 12AU7
BIAS OSC V7B 12AU7
BIAS OSCILLATOR ALIGNMENT
1. Connect a 100Ω 1% composition resistor in series with the black lead of the recording head.
2. Connect the RF probe of a VTVM across the resistor.
3. Adjust A1 for .03VAC on the VTVM.
4. Remove the 100Ω resistor and restore connections.
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SW ON VOLUME CONTROL
DRIVE MOTOR
AUTOMATIC STOP SOLENOID
RECT V8 6X4
117VAC - 130 WATTS (LESS DECK & WITH AUTOMATIC STOP IN OPERATION)
64 WATTS (LESS DECK - RECORD POSITION)
58 WATTS (LESS DECK - PLAY POSITION)
70ma. - RECORD
60ma. - PLAY
300V 280V SOURCE
230V SOURCE
140V SOURCE
L1 TERMINAL GUIDE
5 COLOR DOT

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	↑270K •↑180K	INF •47K	1500Ω	.1Ω	.1Ω	↑150K	10meg	0Ω	0Ω
V2	6AW8A	1000Ω	0Ω	↑150K	0Ω	.1Ω	220Ω	470K	↑4700Ω	↑50Ω
V3	6AW8A	100K	↑150K	↑100K	0Ω	.1Ω	220Ω	470K	↑4700Ω	↑530Ω
V4	12AX7	↑270K •↑180K	INF •47K	1500Ω	.1Ω	.1Ω	↑150K	10meg	0Ω	0Ω
V5	6AW8A	1000Ω	0Ω	↑150K	0Ω	.1Ω	220Ω	470K	↑4700Ω	↑50Ω
V6	6AW8A	100K	↑150K	↑100K	0Ω	.1Ω	220Ω	470K	↑4700Ω	↑530Ω
V7	12AU7	•↑12Ω	100K	1500Ω	.1Ω	.1Ω	◄16Ω	100K	1500Ω	0Ω
V8	6X4	390Ω	NC	0Ω	.1Ω	NC	420Ω	¶		

ALL MEASUREMENTS MADE IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
▰ MEASURED IN "RECORD" POSITION.
↑ MEASURED FROM PIN 7 OF V8.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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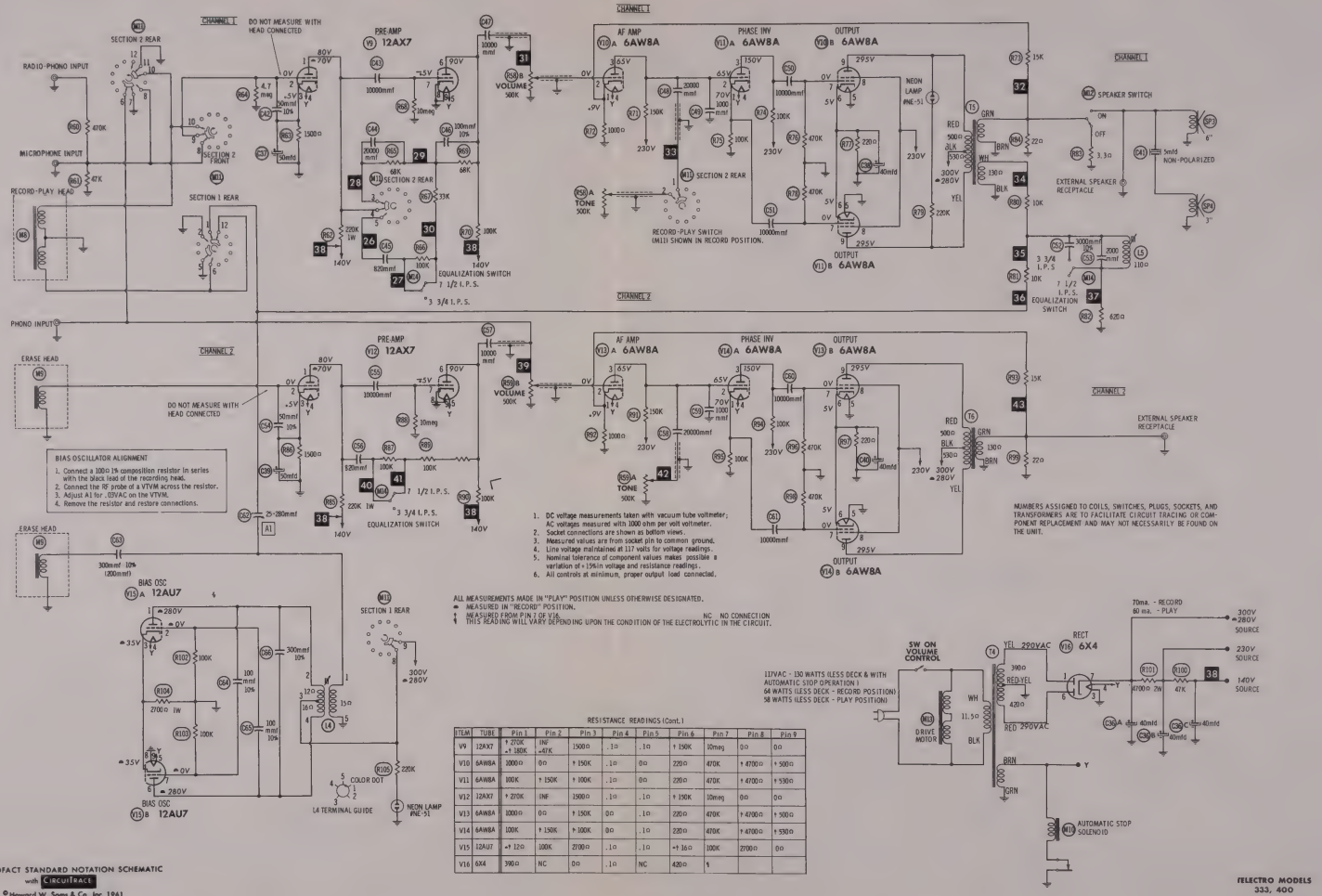
TELECTRO MODELS 333, 400

MODEL 400


CHANNEL 1
CHANNEL 2
RADIO-PHONO INPUT
MICROPHONE INPUT
RECORD-PLAY HEAD
PHONO INPUT
ERASE HEAD
SECTION 1 REAR
SECTION 2 REAR
SECTION 2 FRONT
DO NOT MEASURE WITH HEAD CONNECTED
PRE-AMP 12AX7
AF AMP 6AW8A
PHASE INV 6AW8A
OUTPUT 6AW8A
VOLUME 500K
TONE 500K
NEON LAMP #NE-51
RECORD-PLAY SWITCH (M11) SHOWN IN RECORD POSITION.
EQUALIZATION SWITCH
7 1/2 I.P.S.
3 3/4 I.P.S.
SPEAKER SWITCH
EXTERNAL SPEAKER RECEPTACLE
BIAS OSCILLATOR ALIGNMENT
1. Connect a 100Ω 1% composition resistor in series with the black lead of the recording head.
2. Connect the RF probe of a VTVM across the resistor.
3. Adjust A1 for .07VAC on the VTVM.
4. Remove the resistor and restore connections.
BIAS OSC 12AU7
L4 TERMINAL GUIDE
COLOR DOT
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.
ALL MEASUREMENTS MADE IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
MEASURED IN "RECORD" POSITION.
MEASURED FROM PIN 7 OF V16.
THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
NC - NO CONNECTION
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
117VAC - 130 WATTS (LESS DECK & WITH AUTOMATIC STOP OPERATION)
64 WATTS (LESS DECK - RECORD POSITION)
58 WATTS (LESS DECK - PLAY POSITION)
SW ON VOLUME CONTROL
DRIVE MOTOR
AUTOMATIC STOP SOLENOID
RECT 6X4
70ma. - RECORD
60 ma. - PLAY
300V 280V SOURCE
230V SOURCE
140V SOURCE

RESISTANCE READINGS (Cont.)

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V9	12AX7	↑ 270K ↓ 180K	INF ↓47K	1500Ω	.1Ω	.1Ω	↑ 150K	10meg	0Ω	0Ω
V10	6AW8A	1000Ω	0Ω	↑ 150K	.1Ω	0Ω	220Ω	470K	↑ 4700Ω	↑ 500Ω
V11	6AW8A	100K	↑ 150K	↑ 100K	.1Ω	0Ω	220Ω	470K	↑ 4700Ω	↑ 530Ω
V12	12AX7	↑ 270K	INF	1500Ω	.1Ω	.1Ω	↑ 150K	10meg	0Ω	0Ω
V13	6AW8A	1000Ω	0Ω	↑ 150K	0Ω	.1Ω	220Ω	470K	↑ 4700Ω	↑ 500Ω
V14	6AW8A	100K	↑ 150K	↑ 100K	0Ω	.1Ω	220Ω	470K	↑ 4700Ω	↑ 530Ω
V15	12AU7	↓↑ 12Ω	100K	2700Ω	.1Ω	.1Ω	↓↑ 16Ω	100K	2700Ω	0Ω
V16	6X4	390Ω	NC	0Ω	.1Ω	NC	420Ω	↯		

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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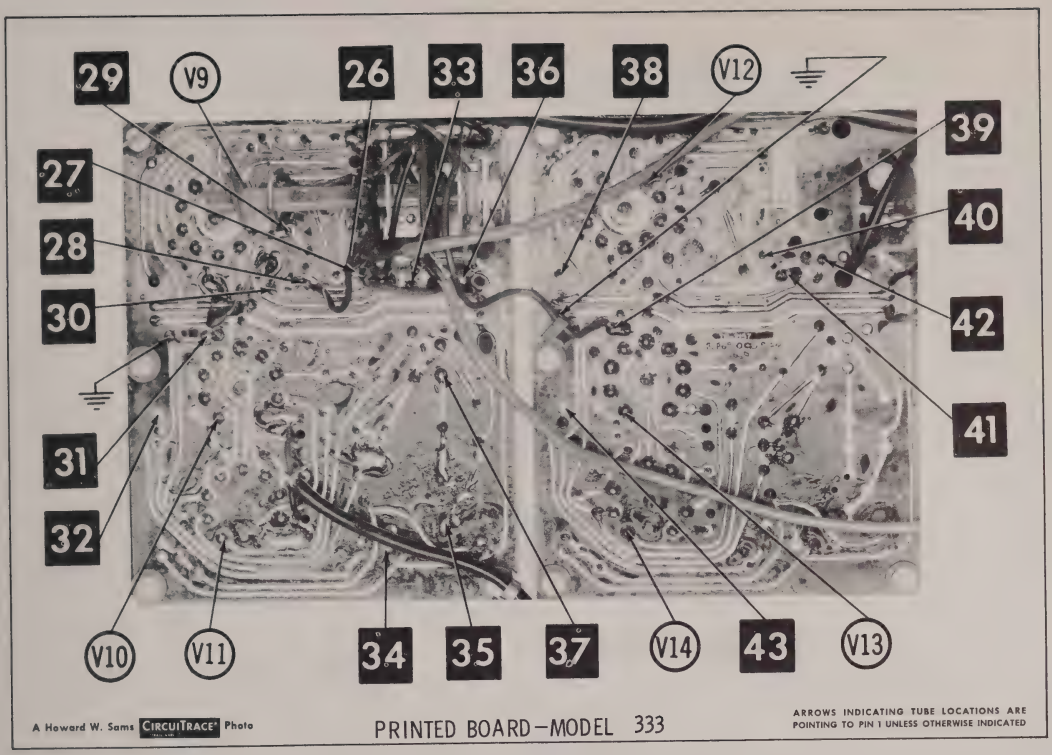
MODEL 333

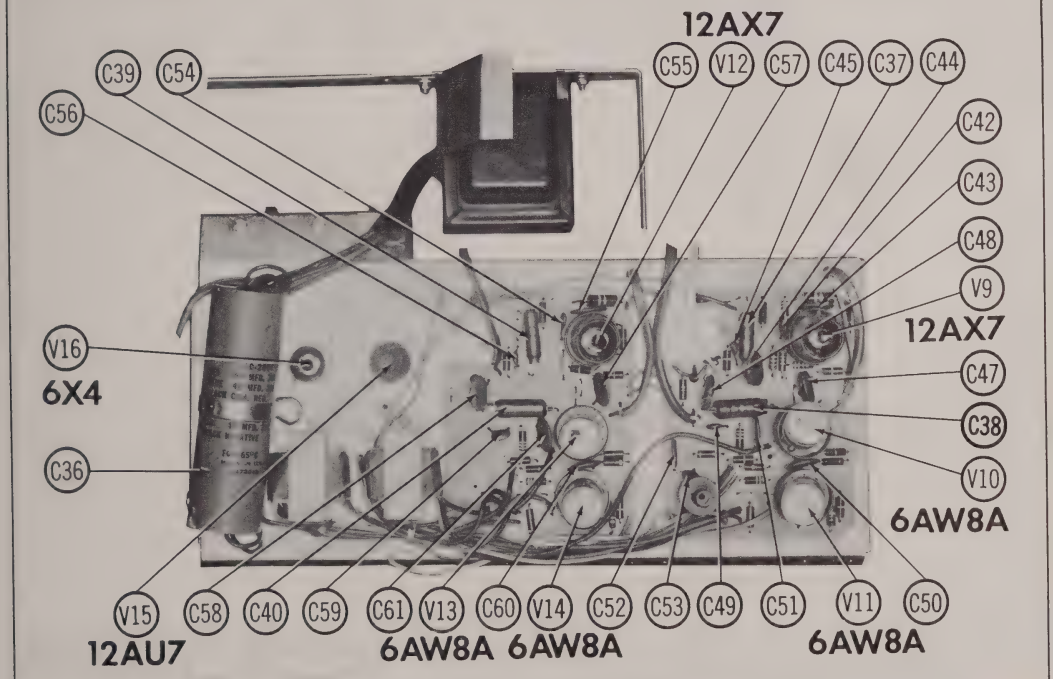
TELECTRO MODELS 333, 400



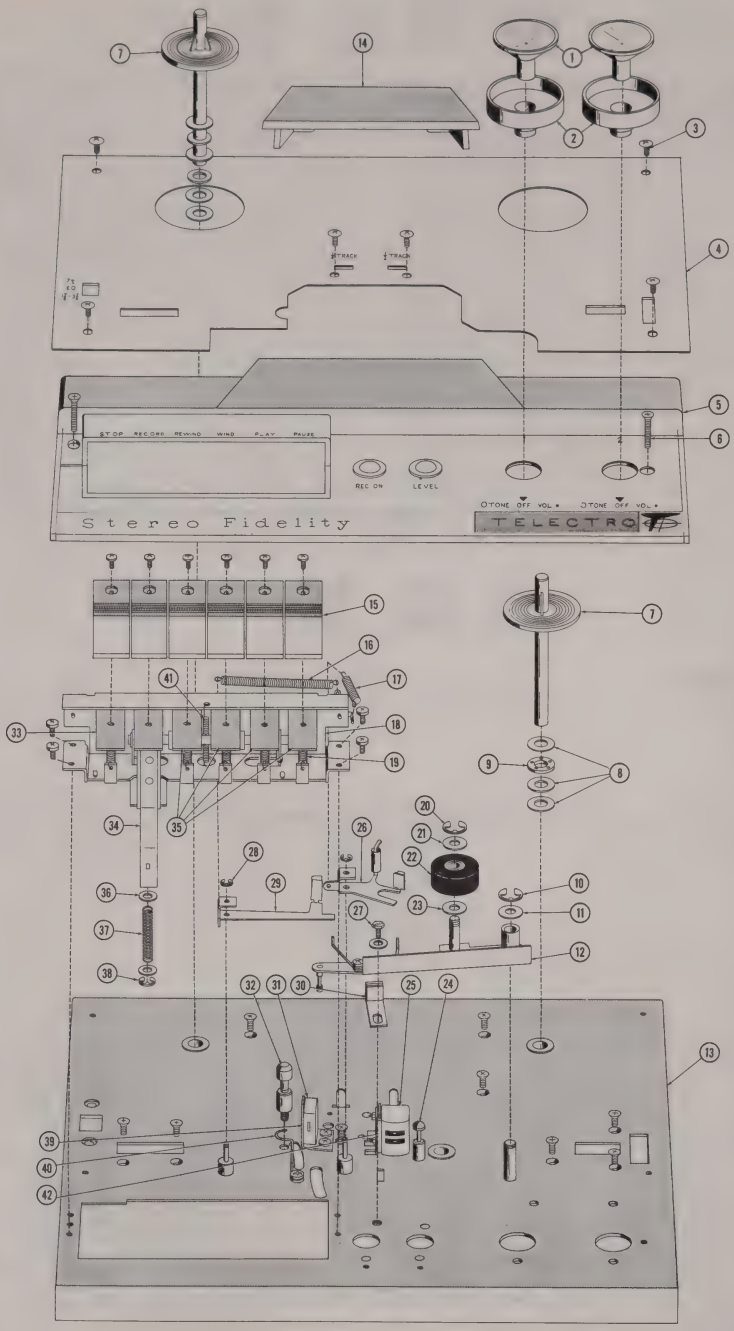
A Howard W. Sams CIRCUITRACE Photo

PRINTED BOARD—MODEL 333

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



CHASSIS TOP VIEW-CAPACITOR & TUBE IDENT--MODEL 333



A PHOTOFACT "EXPLODED" VIEW

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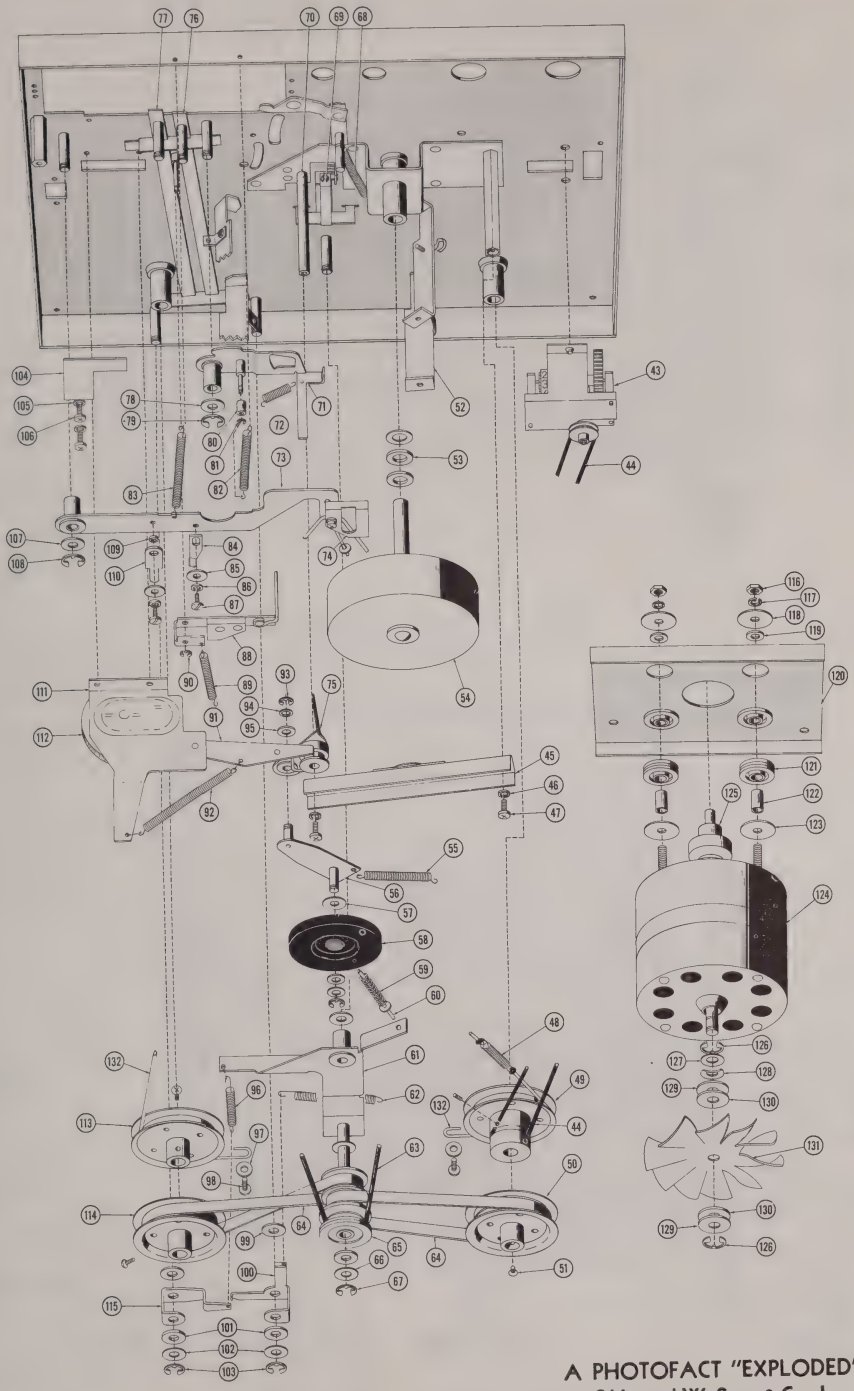
EXPLODED VIEW OF PARTS ABOVE BASE PLATE



A PHOTOFACT "EXPLODED" VIEW
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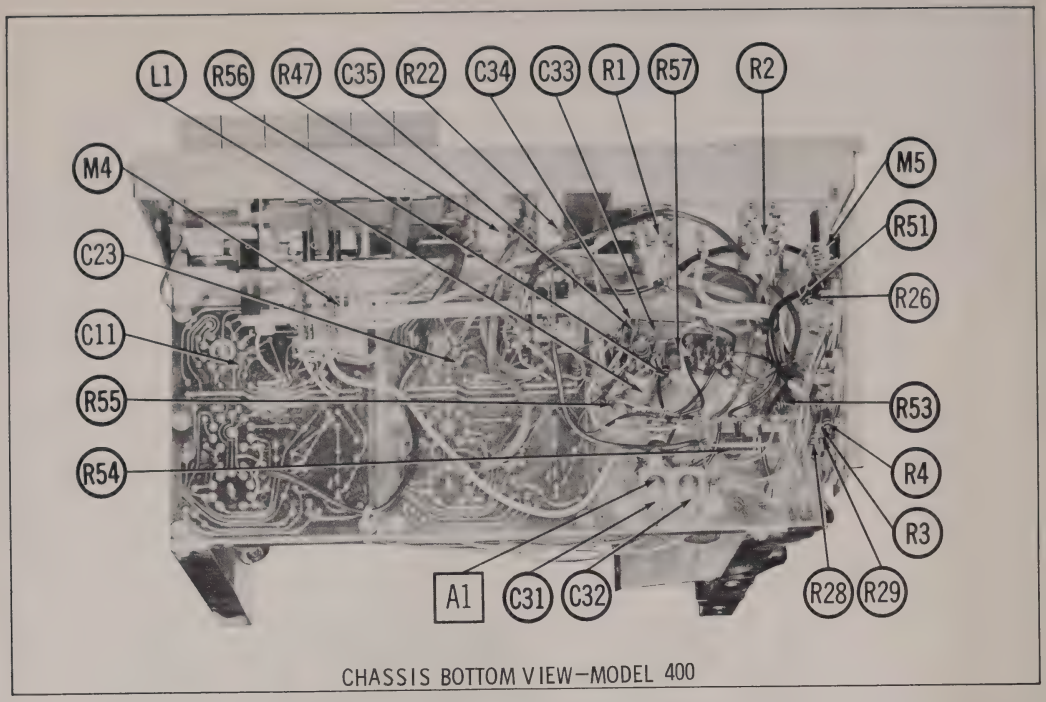
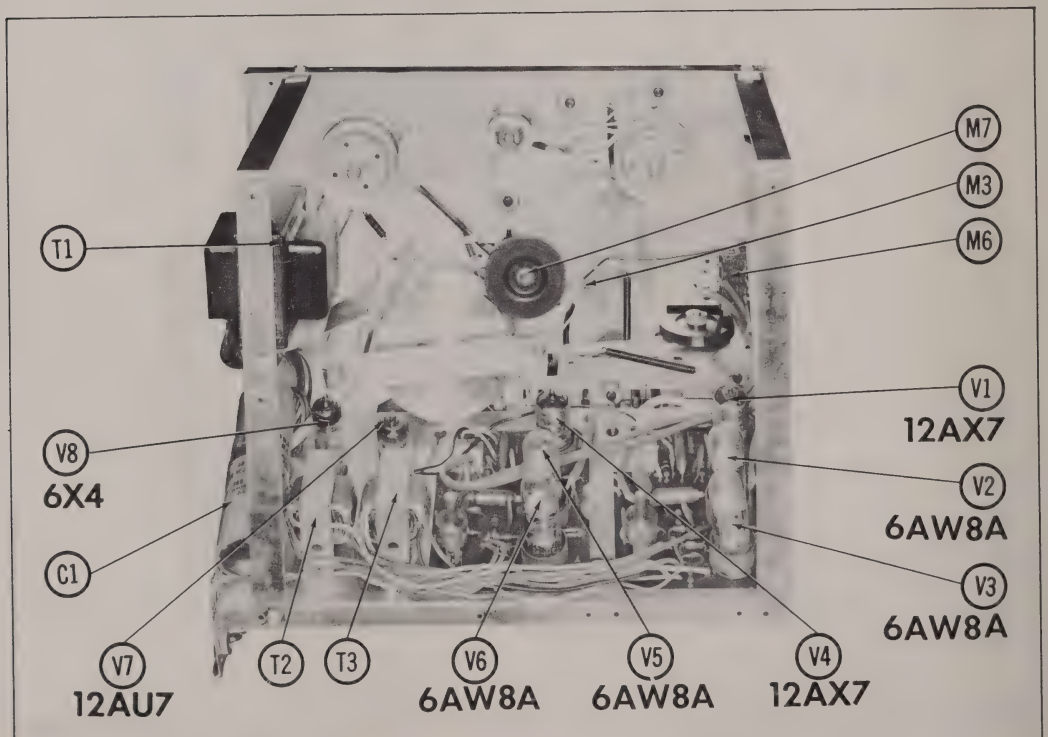
EXPLODED VIEW OF PARTS BELOW BASE PLATE



CHASSIS BOTTOM VIEW—MODEL 400



CHASSIS TOP VIEW—MODEL 400

MODEL 400 PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	Preamplifier	12AX7
V2	AF Amp. -Output	6AW8A
V3	Phase Inv. - Output	6AW8A
V4	Preamplifier	12AX7
V5	AF Amp. -Output	6AW8A
V6	Phase Inv. - Output	6AW8A
V7	Bias Oscillator	12AU7
V8	Rectifier	6X4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	TELECTRO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	300	TC-2001	PR3-020	BBRT0185	WQ795		TVAS-3745 *	
B	40	300							
C	40	300							
C2	50	3	TC-1550	XPP-3050	NLW50-3	TT6X50	ML50-3	TE-1058	
C3	40	10	TC-1996	XPP-10040	NLW40-10	TT15X40	ML40-12	TE-1119	
C4	50	3	TC-1550	XPP-3050	NLW50-3	TT6X50	ML50-3	TE-1058	
C5	40	10	TC-1996	XPP-10040	NLW40-10	TT15X40	ML40-12	TE-1119	
C6	5	10NP	TC-2000	PRS-7405	BBR4-150	TCN105		TVANS-1110 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	50 10%		DI-50	DD-500	L10Q50	CCD-500	GP450	10TS-Q50
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C9	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C10	820		DI-820	DD-821	BYA10T82	CCD-821	B-382	10TS-T82
C11	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C14	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C15	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C16	10000		BPD-01	LD-103	BYA10S1	CCD-103	B-110	5HK-S10
C17	3000 10%		DI-3000		PM6D3	CCD-302	JL-233	10TS-D30
C18	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C19	50 10%		DI-50	DD-500	L10Q50	CCD-500	GP450	10TS-Q50
C20	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C22	820		DI-820	DD-821	BYA10T82	CCD-821	B-382	10TS-T82
C23	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C24	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C25	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C26	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C27	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C28	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C29	3000 10%		DI-3000		PM6D3	CCD-302	JL233	10TS-D30
C30	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C31	25-280	#TC-2007				464		
C32	25-280	#TC-2007				464		
C33	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C34	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C35	600			DD-601	L10T3	CCS-621	GP360	10TS-T60

Telectro Part Number.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	TELECTRO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K		TC-1721	F1-41		† QJ-1510R	■UE4182-S	Tone, Channel 1
B	500K			R2-41				Volume, Channel 1
C	Switch			KR-1				Power Off-On
R2A	500K		TC-1721	F1-41		† QJ-1510R	■UE4182-S	Tone, Channel 2
B	500K			R2-41				Volume, Channel 2
C	Switch			KR-1				(Not Used)

† "CONCENTRIKIT" equivalent: K-15 Kit with base elements & shafts: B13-133, P17-024, (Panel)
(Not available as a factory assembled unit.) B13-133, R1-103, (Rear)
76-1 (Switch)

■ "STA-LOC" equivalent: FB55A, RU55A, OS750A, IS 1187, US41.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	470K	
R4	47K	
R5	220K 1W	
R6	4.7meg	
R7	1500Ω	
R8	68K	
R9	100K	
R10	33K	
R11	10meg	
R12	68K	
R13	100K	
R14	150K	
R15	1000Ω	
R16	15K	
R17	100K	
R18	100K	
R19	470K	
R20	220Ω	
R21	470K	

ITEM No.	RATING	REMARKS
R22	220K	
R23	10K	
R24	10K	
R25	22Ω	
R26	3.3Ω	
R27	620Ω	
R28	470K	
R29	47K	
R30	220K 1W	
R31	1500Ω	
R32	4.7meg	
R33	100K	
R34	68K	
R35	33K	
R36	10meg	
R37	68K	
R38	100K	
R39	150K	
R40	1000Ω	

ITEM No.	RATING	REMARKS
R41	15K	
R42	100K	
R43	100K	
R44	470K	
R45	220Ω	
R46	470K	
R47	220K	
R48	10K	
R49	10K	
R50	22Ω	
R51	3.3Ω	
R52	620Ω	
R53	47K	
R54	4700Ω 2W	
R55	100K	
R56	100K	
R57	1500Ω 1W	

COILS (RF-IF)

ITEM No.	USE	TELECTRO PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	NOTES
L1	Osc. Coil	TC-1937				
L2	Equalization Coil	TC-1947				
L3	Equalization Coil	TC-1947				

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	TELECTRO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V @ 1.1A	580VCT @ .070A DC	6.3V @ 4.8A	TT-770					

MODEL 400 PARTS LIST (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA: TELECTRO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
	PRI.	SEC.1						
T2	9600Ω CT	3-4Ω	TT-774-1					
		SEC. 2						
		64Ω						
	PRI	SEC. 1						
T3	9600Ω CT	3-4Ω						
		SEC. 2						
		64Ω	TT-774					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA: TELECTRO PART No.	QUAM PART No.	NOTES
	SIZE	FIELD	V. C. IMP.			
SP1	6"	PM	3-4Ω	TS-2293	6A21	
SP2	3"	PM	3-4Ω	TS-2292	3A15TZ3.1	

MISCELLANEOUS

ITEM No.	PART NAME	TELECTRO PART No.	NOTES
M1	Head	TH-584	1/4 Track Stereo, Record-Playback
M2	Head	TH-590	1/4 Track Stereo, Erase
M3	Solenoid	TC-1783-1	
M4A	Switch		Record-Playback, Channel 1 (Rotary Wafer Type)
B	Switch		Record-Playback, Channel 2 (Rotary Wafer Type)
M5	Switch		Speaker (DPDT Slide Type
M6	Switch		Power-Off-On (Slide Type)
M7	Motor Assembly	TA-1462	Includes Pulley
	Microphone	TM-410	Includes Cord and Plug

CABINETS & CABINET PARTS

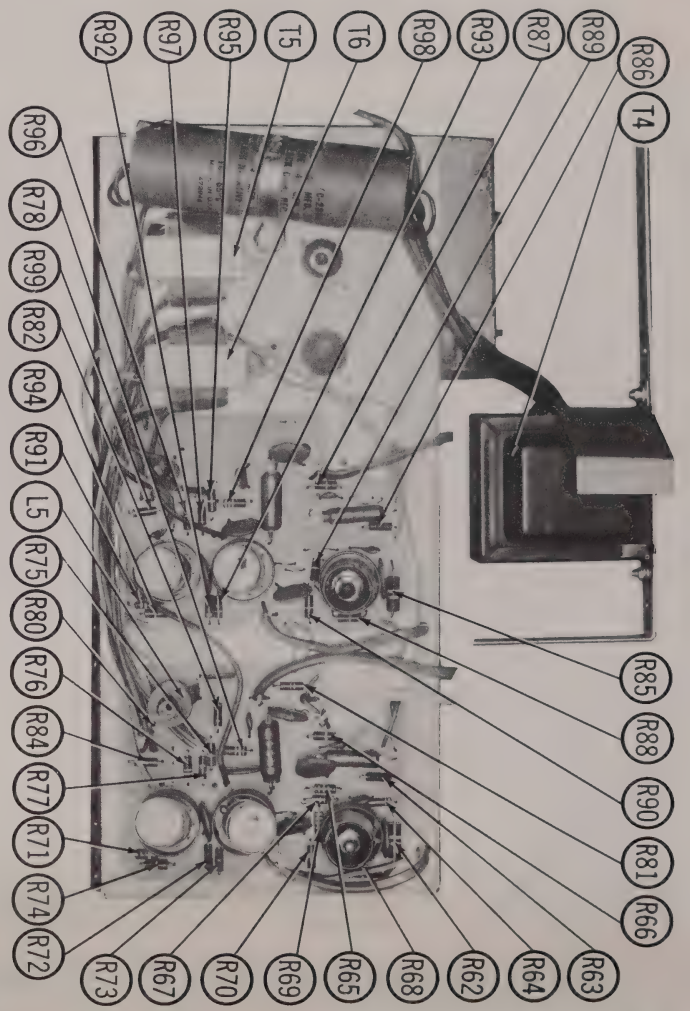
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	TA-1255	Volume, Model 333
Knob	TA-1255	Volume, Model 400
Knob	TK-246	Tone, Model 333
Knob	TK-246	Tone, Model 400
Button-Push	TB-1010	6 Used, Model 333
Button-Push	TB-1010	6 Used, Model 400

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—TOP VIEW MODEL 333



PARTS LIST—MODEL 333

TUBES

ITEM No.	USE	TYPE (GENERAL ELECTRIC • RAYTHEON • SYLVANIA •)
V9	Preamplifier	12AX7
V10	AF Amp. -Output	6AW8A
V11	Phase Inv. - Output	6AW8A
V12	Preamplifier	12AX7
V13	AF Amp. -Output	6AW8A
V14	Phase Inv. - Output	6AW8A
V15	Bias Oscillator	12AU7
V16	Rectifier	6X4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA TELECTRO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C36A	40	300	TC-2001	PR3-020	BBRT0185	WQ795		TVAS-3745 *	
B	40	300							
C	40	300							
C37	50	3	TC-1550	XPP-3050	NLW50-3	TT6X50	ML50-3	TE-1058	
C38	40	10	TC-1996	XPP-10040	NLW40-10	TT15X40	ML40-12	TE-1119	
C39	50	3	TC-1550	XPP-3050	NLW50-3	TT6X50	ML50-3	TE-1058	
C40	40	10	TC-1996	XPP-10040	NLW40-10	TT15X40	ML40-12	TE-1119	
C41	5	10NP	TC-2000	PRS-7405	BBR4-150	TCN105		TVANS-1110 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

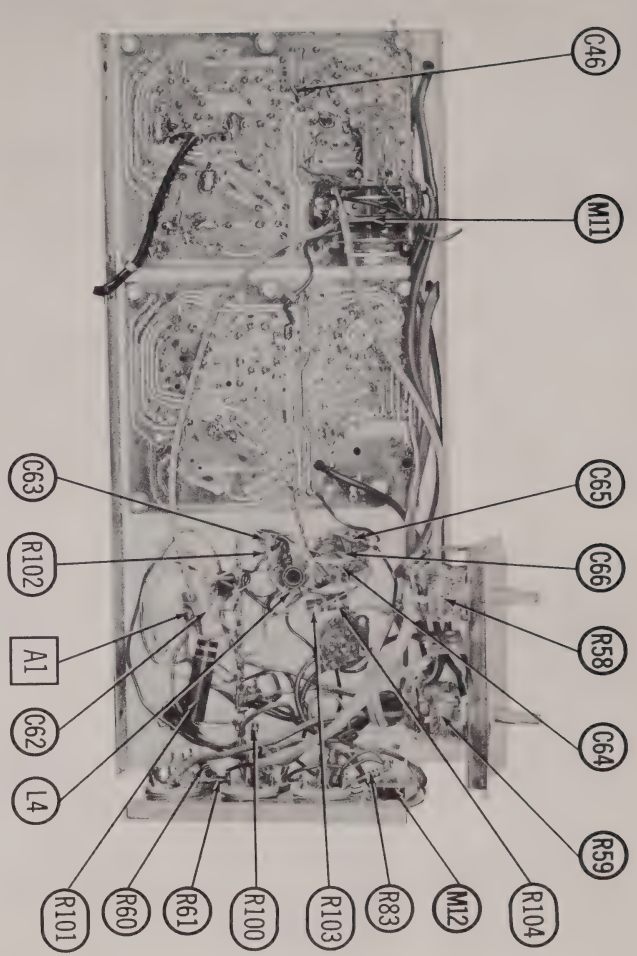
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C42	50 10%		DI-50	DD-500	L10Q50	CCD-500	GP450	10TS-Q50
C43	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C44	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C45	820		DI-820	DD-821	BYA10T82	CCD-821	B-382	10TS-T82
C46	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C47	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C48	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C49	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C50	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C51	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C52	3000 10%		DI-3000		PM6D3	CCD-302	JL233	10TS-D30
C53	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C54	50 10%		DI-50	DD-500	L10Q50	CCD-500	GP450	10TS-Q50
C55	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C56	820		DI-820	DD-821	BYA10T82	CCD-821	B-382	10TS-T82
C57	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C58	20000		BPD-02	DD-203	BYA10D2	CCD-203	B-120	5HK-S20
C59	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C60	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C61	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C62	25-280	#TC-2007				464		
C63	300 10%	(200) †	DI-300	DD-301	L10T3	CCD-301	GP330	10TS-T30
C64	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C65	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C66	300 10%		DI-300	DD-301	L10T3	CCD-301	GP330	10TS-T30

\# Telectro Part Number.
† Alternate Value.

CHASSIS—BOTTOM VIEW MODEL 333



PARTS LIST MODEL 333 (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TELECTRO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R58A	500K		TC-1721	F1-41				Tone, Channel 3
B	500K			R2-41		†QJ-1510R	■UE4182S	Volume, Channel 3
C	Switch			KR-1				Power Off-On
R59A	500K		TC-1721	F1-41				Tone, Channel 4
B	500K			R2-41		† QJ-1510R	■ UE4182S	Volume, Channel 4
C	Switch			KR-1				(Not Used)

† "CONCENTRIKIT" equivalent: K-15 Kit with base elements & shafts: Bl3-133, Pl7-024, (Panel)
(Not available as a factory assembled unit.) Bl3-133, Rl-103, (Rear)
76-1 (Switch)

■ "STA-LOC" equivalent: FB55A, RU55A, OS750A, LS1187, US41.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R60	470K	
R61	47K	
R62	220K 1W	
R63	1500Ω	
R64	4.7meg	
R65	68K	
R66	100K	
R67	33K	
R68	10meg	
R69	68K	
R70	100K	
R71	150K	
R72	1000Ω	
R73	15K	
R74	100K	
R75	100K	

ITEM No.	RATING	REMARKS
R76	470K	
R77	220Ω	
R78	470K	
R79	220K	
R80	10K	
R81	10K	
R82	620Ω	
R83	3.3Ω	
R84	22Ω	
R85	220K 1W	
R86	1500Ω	
R87	100K	
R88	10meg	
R89	100K	
R90	100K	
R91	150K	

ITEM No.	RATING	REMARKS
R92	1000Ω	
R93	15K	
R94	100K	
R95	100K	
R96	470K	
R97	220Ω	
R98	470K	
R99	22Ω	
R100	47K	
R101	4700Ω 2W	
R102	100K	
R103	100K	
R104	2700Ω 1W	
R105	220K	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		TELECTRO PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L4	Osc. Coil	TC-1937				
L5	Equalization Coil	TC-1947				

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	TELECTRO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T4	117V@ 1.1A	580 VCT @ .070A DC	6.3V@ 4.8A	TT-770					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	TELECTRO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T5	9600Ω CT	3-4Ω	TT-774					
		SEC. 2						
		64Ω						
	PRI.	SEC. 1						
T6	9600Ω CT	3-4Ω	TT-774-2	A-2938	A-3856	22S86	S-51X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TELECTRO PART No.	QUAM PART No.	
SP3	6"	PM	3-4Ω	TS-2293	6A21	
SP4	3"	PM	3-4Ω	TS-2292	3A15TZ3.1	

MISCELLANEOUS

ITEM No.	PART NAME	TELECTRO PART No.	NOTES
M8	Head	TH-584	1/4 Track Stereo, Record-Playback
M9	Head	TH-556	1/4 Track Stereo, Erase
M10	Solenoid	TC-1783-1	
M11	Switch		Record-Playback (Rotary Wafer Type)
M12	Switch		Speaker (DPDT Slide Type)
M13	Motor Ass'y.	TA-1462	Includes Pulley
	Microphone	TM-410	Includes Cord & Plug

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

V-M MODELS 207, 307

V-M MODELS 207, 307

V-M MODELS 207, 307

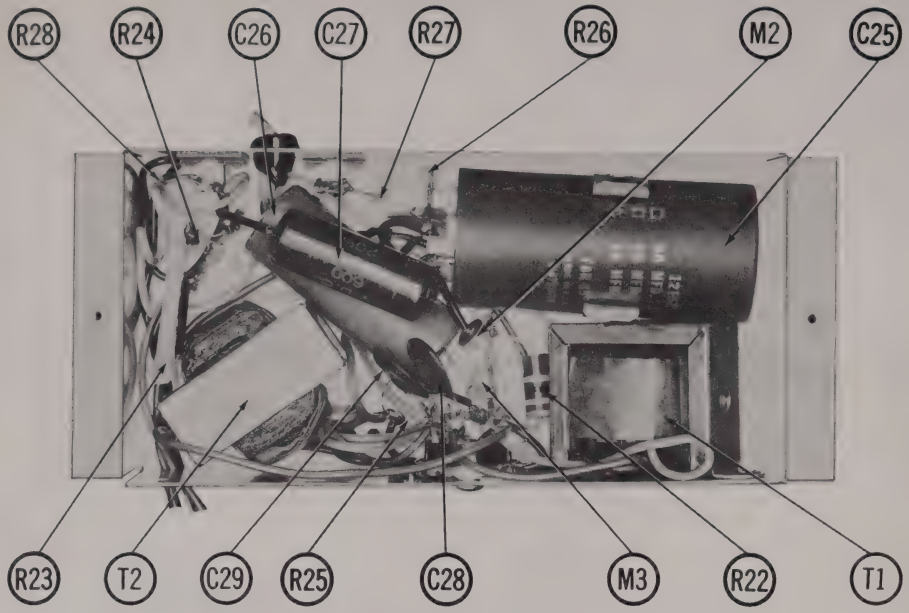
TRADE NAME	V-M Models 207, 307
MANUFACTURER	V-M Corp., 375 W. Main Street, Benton Harbor, Michigan
TYPE SET	AC Operated 3 Tube Stereo Phono Amplifier With 4-Speed Automatic Record Changer (Model 207 is a Manual Record Player)
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles RATING 49 Watts, .5 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER – SEE V-M 1201 – PHOTOFACT SET 436 FOLDER 18 OR RECORD CHANGER MANUAL RC-12

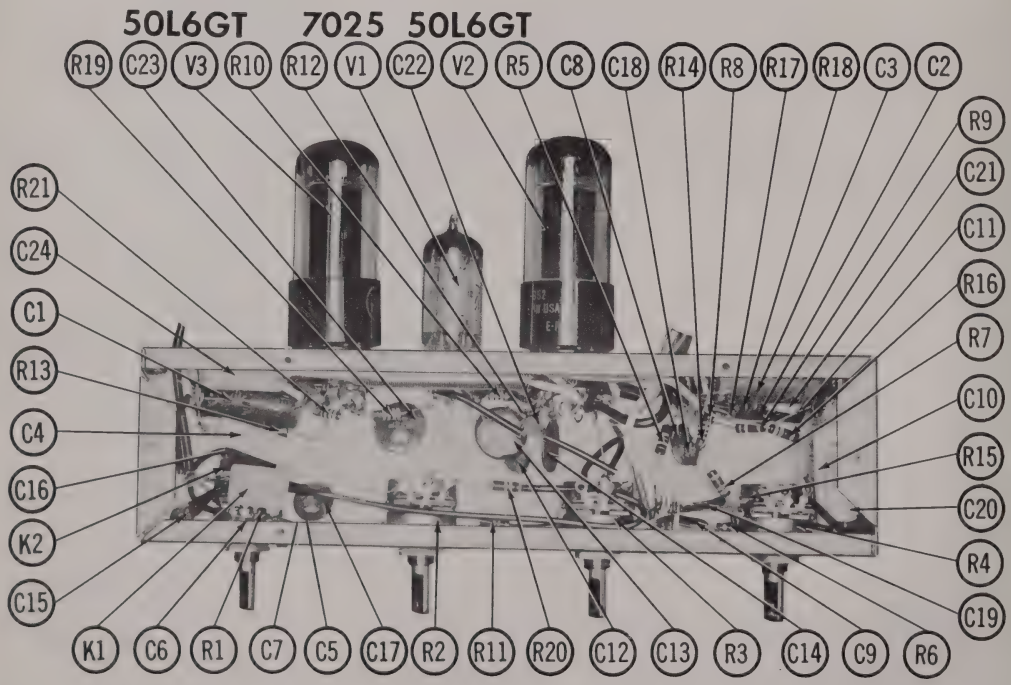
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KT376

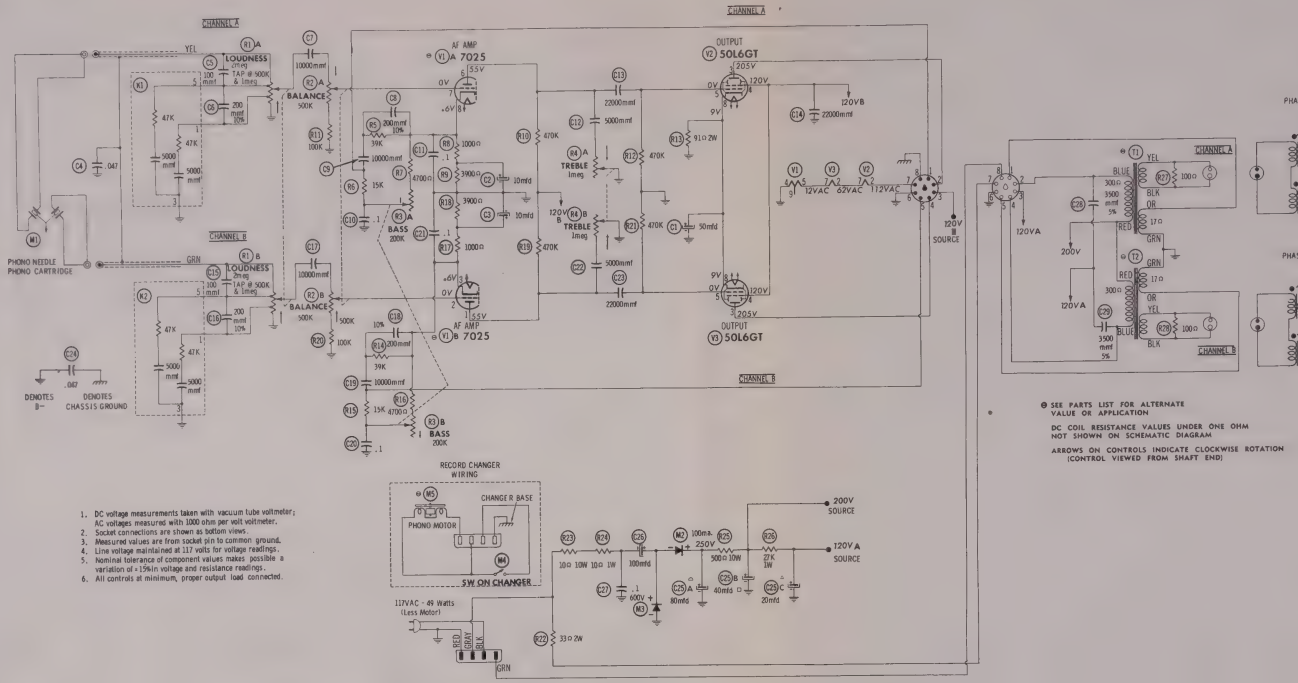
the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. ©1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



POWER CHASSIS



AMP CHASSIS



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	7025	†500K	100K	4900Ω	0Ω	15Ω	†90K	100K	4900Ω	NC
V2	50L6GT	TP	110Ω	†800Ω	†27K	470K	TP	65Ω	91Ω	
V3	50L6GT	TP	65Ω	†800Ω	†27K	470K	NC	15Ω	91Ω	

† MEASURED FROM OUTPUT OF M2. NC NO CONNECTION TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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V-M MODELS 207, 307

POWER PARTS LIST AND DESCRIPTIONS

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA V-M PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C25A	▲80	350	12157	AFH3-29	C0230	FP454.2	TMT-3577	TVL-3724.7	
B	■40	350							
C	▲20	350							
C26	100	150	12138	PRS1510	BR10015	TC493	TD-100-450	TVA-1420	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C27	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C28	3500 5%				1R5D36	CM-20B-362J		MS-236
C29	3500 5%				1R5D36	CM-20B-362J		MS-236

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R22	33Ω 2W	
R23	10Ω 10W	Pt. #12406-10 IRC#PW10-10Ω

ITEM No.	RATING	REMARKS
R24	10Ω 1W	
R25	500Ω 10W	Pt. #12435 IRC#PW10-500Ω

ITEM No.	RATING	REMARKS
R26	27K 1W	
R27	100Ω	
R28	100Ω	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC. [1]	REPLACEMENT DATA V-M PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	3900Ω	4-6Ω	12640-1 ①					① Alternate Part #12640
		SEC. 2						
		27Ω						
	PRI.	SEC. 1						
T2	3900Ω	4-6Ω	12640-1 ①					
		SEC. 2						
		27Ω						

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA V-M PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	6"	PM	2-3Ω	21650-2 *	6A15Z2	* Alternate Part #21650
SP2	5 1/4"	PM	2-3Ω	21649-1 †	52A1Z2	† Alternate Part #21649
SP3	6"	PM	2-3Ω	21650-2 *	6A15Z2	
SP4	5 1/4"	PM	2-3Ω	21649-1 †	52A1Z2	

POWER RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA V-M PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M2	.100A	12602 *	1N1763 *	2F4 *	SR200 *	* Silicon Type
M3	.100A	12602 *	1N1763 *	2F4 *	SR200 *	

MISCELLANEOUS

ITEM No.	PART NAME	V-M PART No.	NOTES
M4	Switch	9890	Off-On-Reject (Part of Changer)
M5	Motor Ass'y.	21566	Complete (Includes motor, Part #9134) (Alliance)
	Motor Ass'y.	21576	Complete (Includes motor, Part #9134) (GI)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

AMP PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel A AF Amp. - Channel B AF Amp.	7025 (12AX7) *	V2 V3	Channel A Output Channel B Output	50L6GT 50L6GT

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	V-M PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	50	25	23002	PRS1265	BBR50-25	TC29	TD-50-25	TVA-1206	
C2	10	10	23001	PRS1250	BBR10-25	TC22	TD-10-25	TVA-1204	
C3	10	10	23001	PRS1250	BBR10-25	TC22	TD-10-25	TVA-1204	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C5	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C6	200 10%		DI-200	DD-201	L10T2	CCD-201	GP320	10TS-T20
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	200 10%		DI-200	DD-201	L10T2	CCD-201	GP320	10TS-T20
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C11	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C12	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C13	22000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S22
C14	22000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S22
C15	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C16	200 10%		DI-200	DD-201	L10T2	CCD-201	GP320	10TS-T20
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C18	200 10%		DI-200	DD-201	L10T2	CCD-201	GP320	10TS-T20
C19	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C20	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C21	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C22	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C23	22000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S22
C24	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	V-M PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg *		12424	BT-175				Loudness, Channel A
B	2meg *			STR-175				Loudness, Channel B
R2A	500K		12423	B-60				Balance, Channel A
B	500K			SR-613				Balance, Channel B
R3A	200K		12421	B-51	AD47-250K-Z		FA254A	Bass, Channel A
B	200K			SR-51	Not Req.		RU254A	Bass, Channel B
C	Shaft			Not Req.	FS-3		CS3500	
R4A	1meg		12422	B-70	AD47-1meg-Z		FA16A	Treble, Channel A
B	1meg			SR-70	Not Req.		RU16A	Treble, Channel B
C	Shaft			Not Req.	FS-3		CS3500	

* Taps @ 500K and 1meg.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	39K	
R6	15K	
R7	4700Ω	
R8	1000Ω	
R9	3900Ω	
R10	470K	

ITEM No.	RATING	REMARKS
R11	100K	
R12	470K	
R13	91Ω 2W	
R14	39K	
R15	15K	
R16	4700Ω	

ITEM No.	RATING	REMARKS
R17	1000Ω	
R18	3900Ω	
R19	470K	
R20	100K	
R21	470K	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	V-M PART No.	REPLACEMENT DATA
K1	Loudness Comp.	5000mmf, 5000mmf, 47K, 47K	12569	
K2	Loudness Comp.	5000mmf, 5000mmf, 47K, 47K	12569	

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	V-M PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M1	18973-A	21408 * (LP) 21407 * (78RPM)	80-TS	N7-7 * & N8-3 *	96T	Not Req.	12TH-S	Not Req.	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	21221-C	Loudness, Bass, Treble, Balance
Cabinet	21376-A	
Handle	21780	

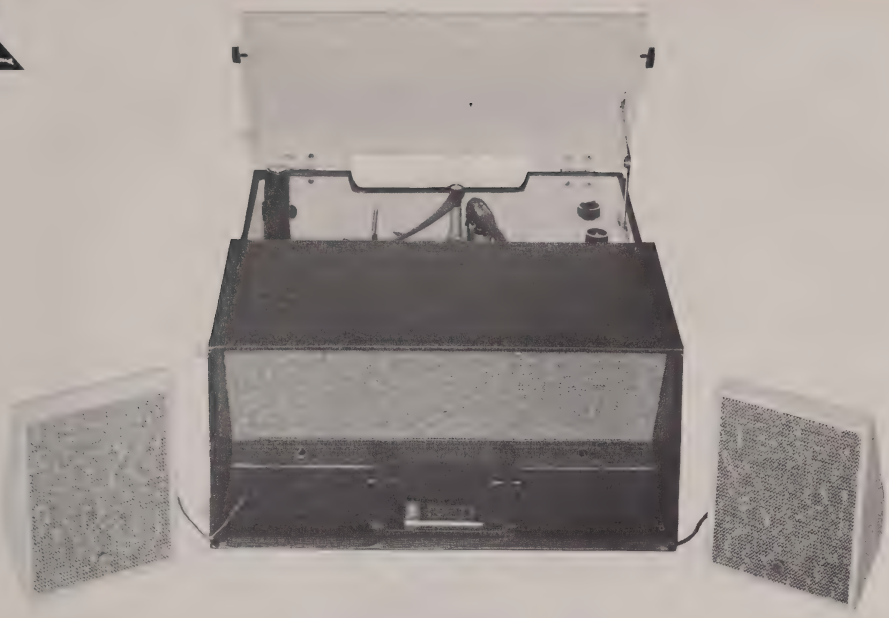
WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

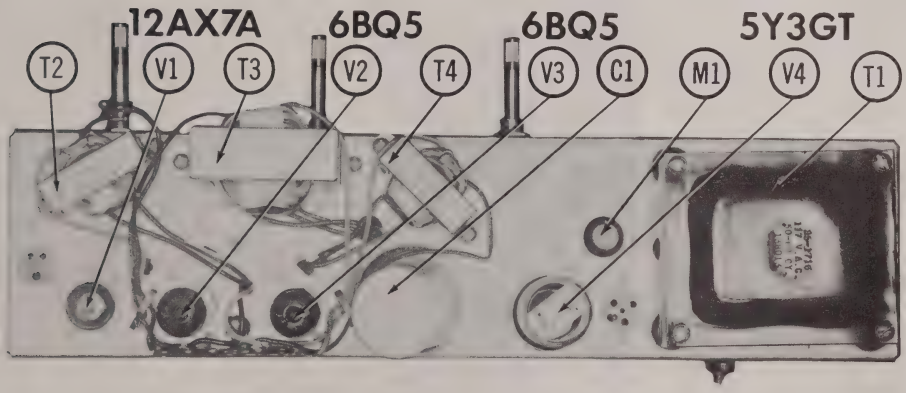
**ZENITH MODEL
SFD111J (CH. 4D20)**

ZENITH MODEL
SFD111J (CH. 4D20)



TRADE NAME	Zenith Model SFD111J (Ch. 4D20)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois
TYPE SET	AC Operated 4 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles RATING 71 Watts, .82 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER #169-118 – SEE SIMILAR V-M 1201 – PHOTOFACT SET 436 FOLDER 18 OR RECORD CHANGER MANUAL RC-12



ZENITH MODEL
SFD111J (CH. 4D20)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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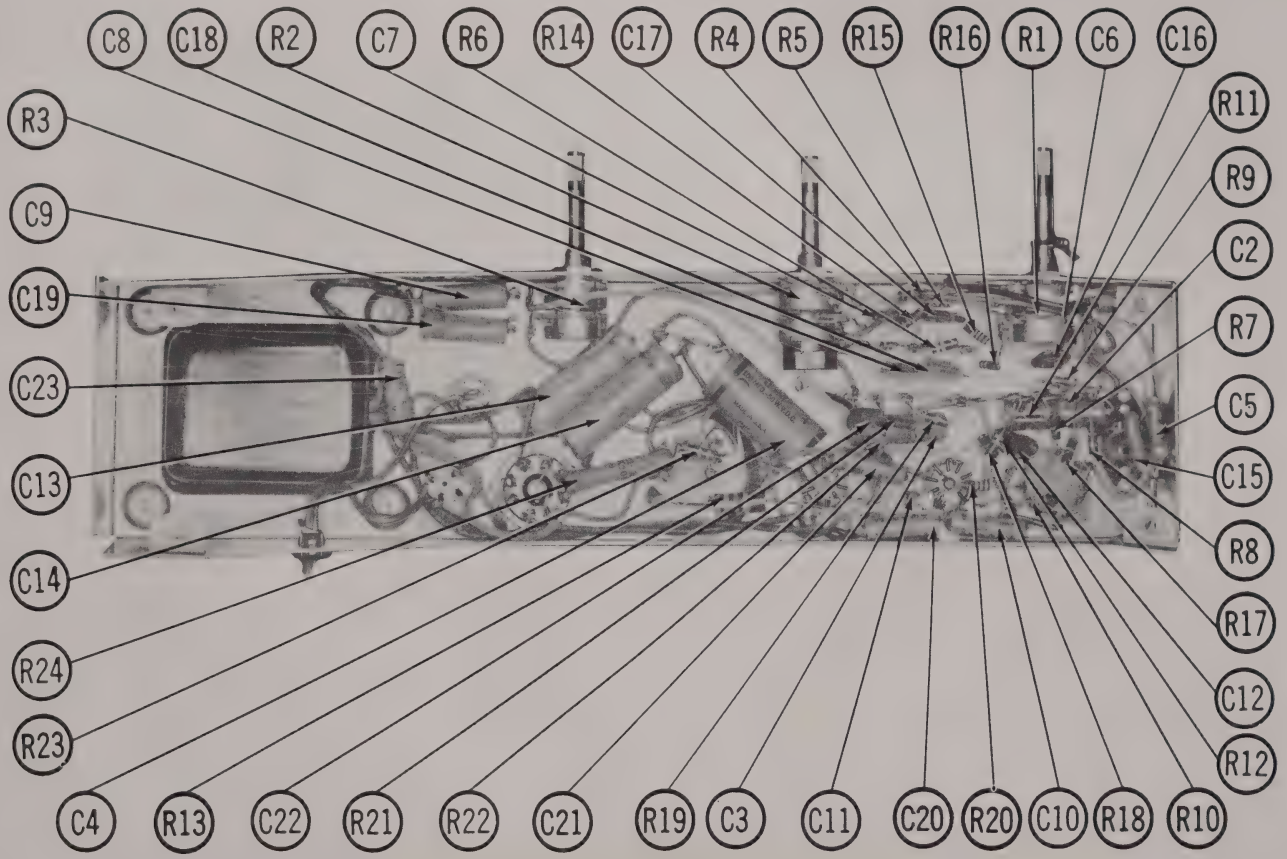


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUBES

ITEM No.	USE	GENERAL ELECTRIC • RAYTHEON • SYLVANIA TYPE
V1	Left Channel AF Amp. - Right Channel AF Amp.	12AX7A
V2	Left Channel Output	6BQ5
V3	Right Channel Output	6BQ5
V4	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲80	450	22-3046	AFH3-46	C0370	FP378	TMT-3763	TVL-3793	Note 1
B	■40	450							
C	▲20	350							
C2	50	12	22-2883	PRS1265	BBR5025	TC29	TD-50-25	TE-1133	
C3	50	12	22-2883	PRS1265	BBR5025	TC29	TD-50-25	TE-1133	
C4	100	50	22-3241	PRS1360	BR1005	TC3501	TD-100-50	TVA-1310	

Note 1. C1A may be 40mfd in some versions.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	220 10%		NPO-SI 220	D6-221	L10T22	CCD-221	GP322	10TS-T22
C6	47 N75 10%	#22-2376						
C7	1000 1000V 10%		DI-1000	DD-102		CCD-102	GP210	10TS-D10
C8	3300 10%		DI-3300			CCD-332	JL-233	10TS-D33
C9	.022 400V		P288N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C10	.001 200V 10%		V84C6D1-10%	DD-102	PM6D1	6DP-1-102	GEM-1621	6TM-D10
C11	.0015 600V 10%		V84C6D15-10%	DD-152	PM6D15	6DP-1-152	GEM-16215	6TM-D15
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C13	.1 600V 10%		V84C6P1-10%		PM6P1	6DP-4-104	GEM-1001	6TM-P10
C14	.1 600V 10%		V84C6P1-10%		PM6P1	6DP-4-104	GEM-1001	6TM-P10
C15	220 10%		NPO-SI 220	D6-221	L10T22	CCD-221	GP322	10TS-T22
C16	47 N75 10%	#22-2376						
C17	1000 1000V 10%		DI-1000	DD-102		CCD-102	GP210	10TS-D10
C18	3300 10%		DI-3300			CCD-332	JL-233	10TS-D33
C19	.022 400V		P288N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C20	.001 200V 10%		V84C6D1-10%	DD-102	PM6D1	6DP-1-102	GEM-1621	6TM-D10
C21	.0015 600V 10%		V84C6D15-10%	DD-152	PM6D15	6DP-1-152	GEM-16215	6TM-D15
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C23	.01 600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10

Zenith Part Number.

CONTROLS

ITEM No.	RATING RESIST-ANCE	RATING WATTS	REPLACEMENT DATA ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg *		63-4668					Loudness, Left Channel
B	2meg *							Balance, Right Channel
R2A	5meg		63-4670	TPL-106				Bass, Left Channel
B	5meg			Not Req.				Bass, Right Channel
C	Switch			Not Req.				Stereo-Monaural
R3A	500K		63-4669	B-60	AD47-500K-Z		FA55A	Treble, Left Channel
B	500K			SR-60	Not Req.		RU55A	Treble, Right Channel
C	Shaft			Not Req.	KSS-3		CS3500	

* Taps ⓐ 500K and 1meg.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	330K	
R5	330K	
R6	100K	
R7	220K	
R8	180Ω	
R9	820Ω	
R10	470K	

ITEM No.	RATING	REMARKS
R11	1meg	
R12	4700Ω	
R13	180Ω 2W	
R14	330K	
R15	330K	
R16	100K	
R17	220K	

ITEM No.	RATING	REMARKS
R18	180Ω	
R19	820Ω	
R20	470K	
R21	1meg	
R22	4700Ω	
R23	5600Ω	
R24	7500Ω 3W	IRC#PW5-7500Ω

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA ZENITH PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117Vⓐ ⓐ .82A	640VCT ⓐ .070A	5Vⓐ 2A	95-1716					
	SEC. 3	SEC. 4	SEC. 5						
	6.3VCT ⓐ 1.8A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA ZENITH PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	3600Ω	14-16Ω	95-1715	A-2900	A-3856	24S04	S-51X	
T3	11K	6-8Ω	95-1714	A-3027	A-3870	22S88	S-55X	
T4	3600Ω	14-16Ω	95-1715	A-2900	A-3856	24S04	S-51X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA ZENITH PART No.	QUAM PART No.	NOTES
SP1	5 1/4"	PM	14-16Ω	49-915	52A21ZI6	
SP2	10"	PM	6-8Ω	49-914	10A4AZ6.4	
SP3	5 1/4"	PM	14-16Ω	49-915	52A21ZI6	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA ZENITH PART No. FUSE	ZENITH PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	2A 250V		62-23 15-201 (CAP)	312002 (3AG 2A 250V)	342001	AGC 2	HKP

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

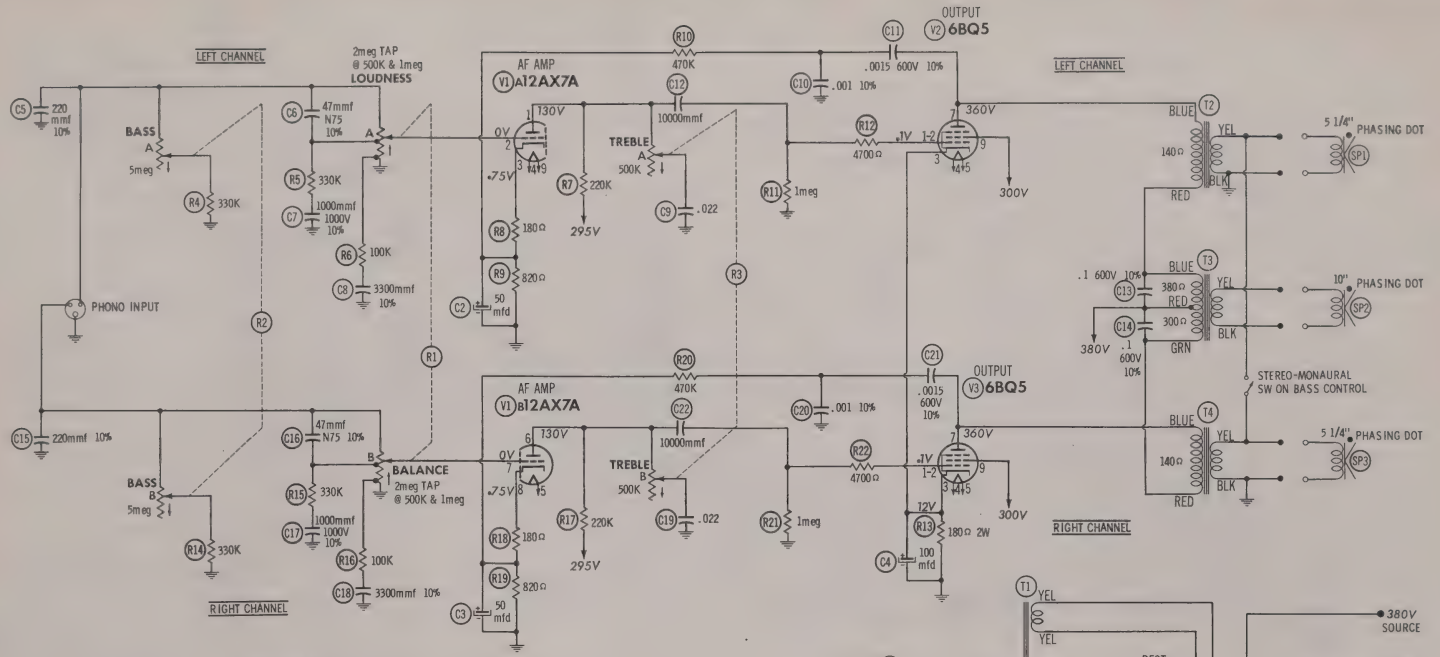
ITEM No.	REPLACEMENT DATA ZENITH PART No. CARTRIDGE	ZENITH PART No. NEEDLE*	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE*	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE*	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE*	NOTES
M2	142-103	Not Req.	137 137B①	Not Req.	13	Not Req.	10T2-S①	Not Req.	① Includes Holder

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Switch		Off-On-Reject (Part of Changer)
M4	Motor		Phono-Drive (Part of Changer)

ZENITH MODEL SFD111J (CH. 4D20)

FOLDER 13



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7A	†233K	0Ω	1000Ω	.1Ω	.1Ω	†233K	0Ω	1000Ω	.1Ω
V2	6BQ5	NC	1meg	180Ω	.1Ω	.1Ω	NC	†520Ω	NC	†7500Ω
V3	6BQ5	NC	1meg	180Ω	.1Ω	.1Ω	NC	†440Ω	NC	†7500Ω
V4	5Y3GT	NC	¶	NC	75Ω	TP	85Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V4. NC NO CONNECTION TP TIE POINT

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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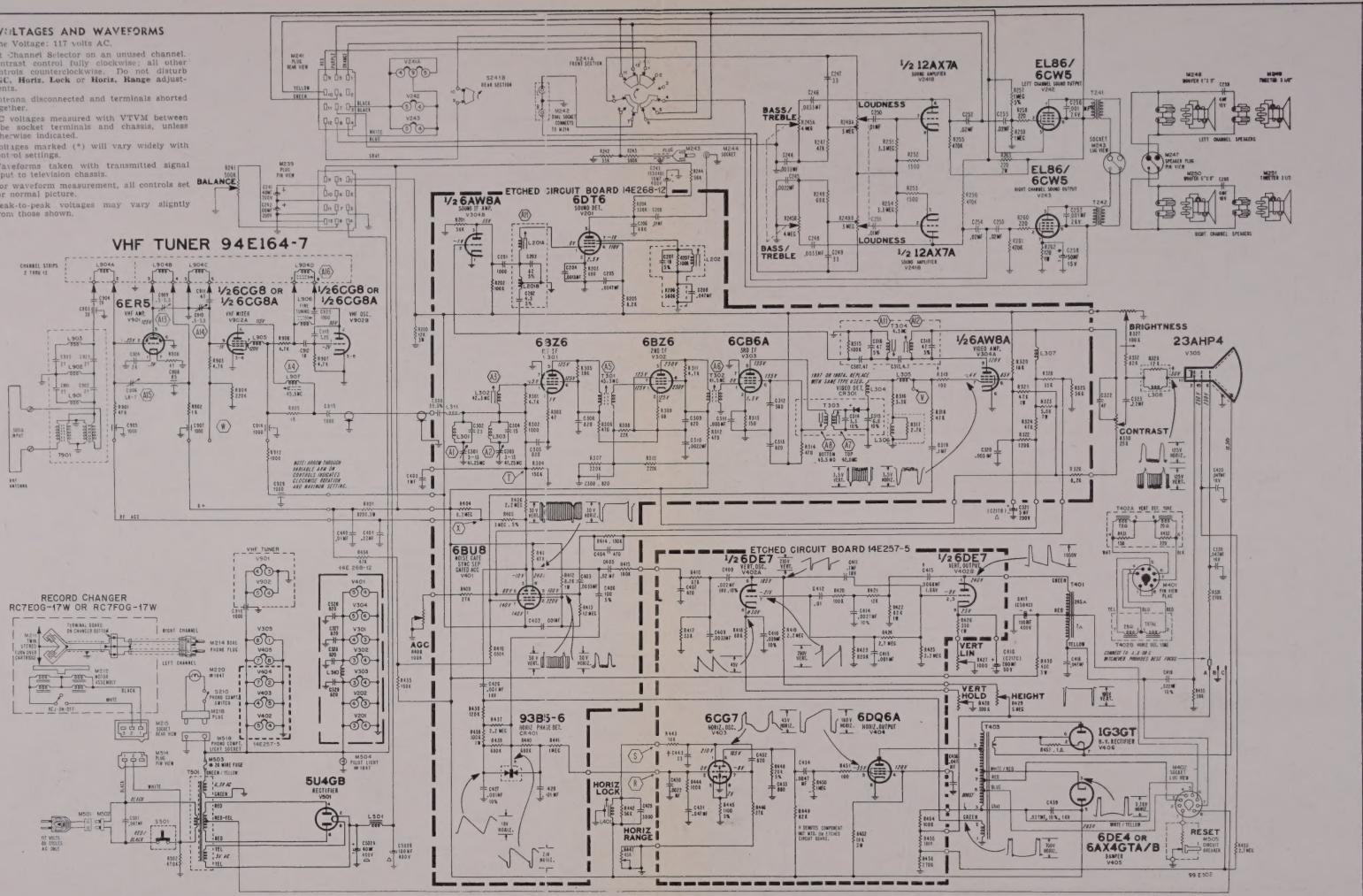
ZENITH MODEL SFD111J (CH. 4D20)

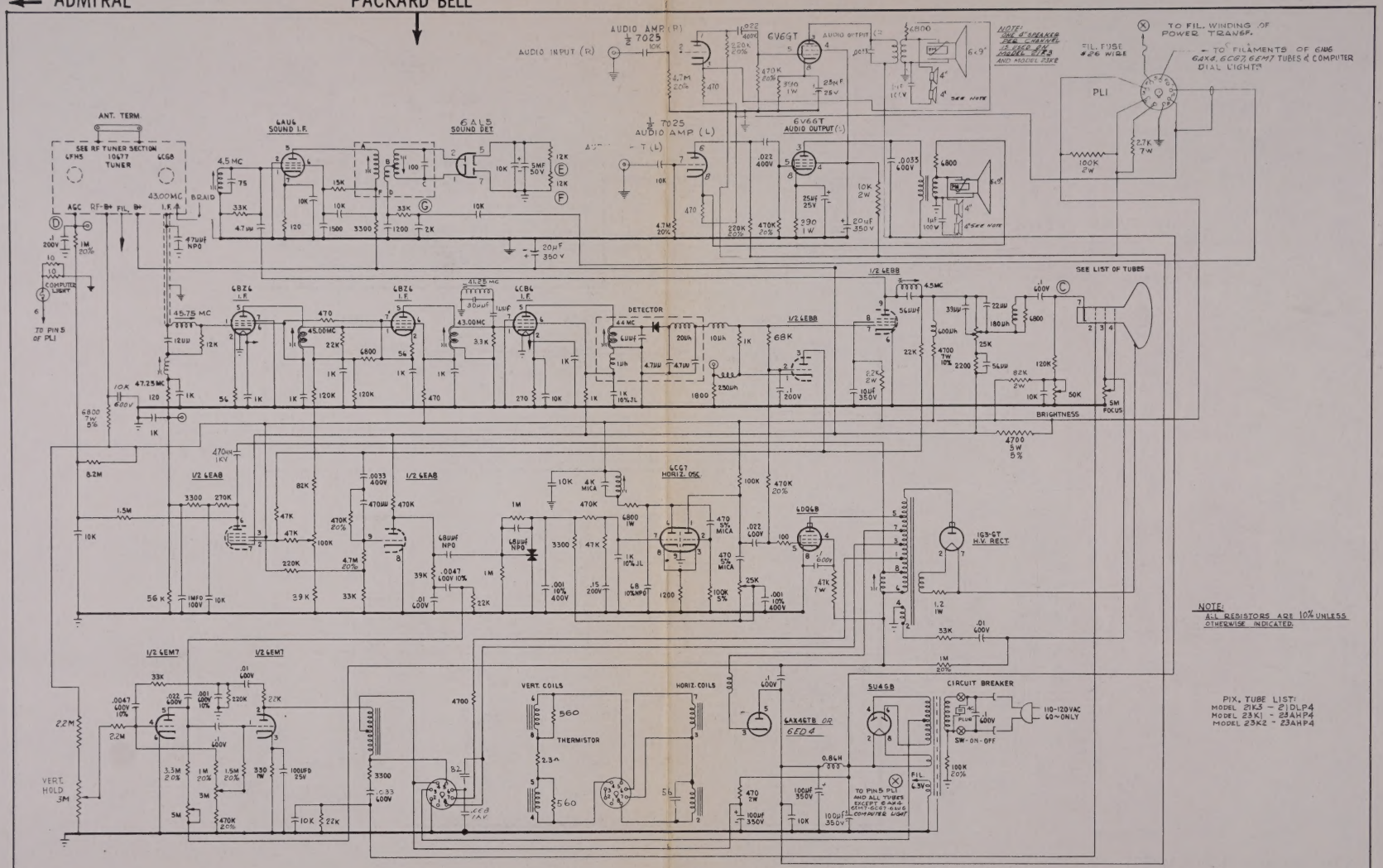


ADMIRAL MODELS CG24K131, 132, 133, CG24UK131, 132, 133, STG24K131, 132, 133, TG24K120, 122, 123, TG24UK120, 122, 123 (CH: 20K7, B, 20L7, 20UK7, B)

Schematic Diagram Courtesy of Admiral Corporation

← ADMIRAL

PACKARD BELL



NOTE:
ALL RESISTORS ARE 10% UNLESS OTHERWISE INDICATED.

PIX. TUBE LIST:
MODEL 21K3 - 21DLP4
MODEL 23K1 - 23AHP4
MODEL 23K2 - 23AHP4

PACKARD BELL MODELS 21K3, 23K1, 23K2 (CH. 88-11)

Schematic Diagram Courtesy of Packard Bell Electronics Corp.

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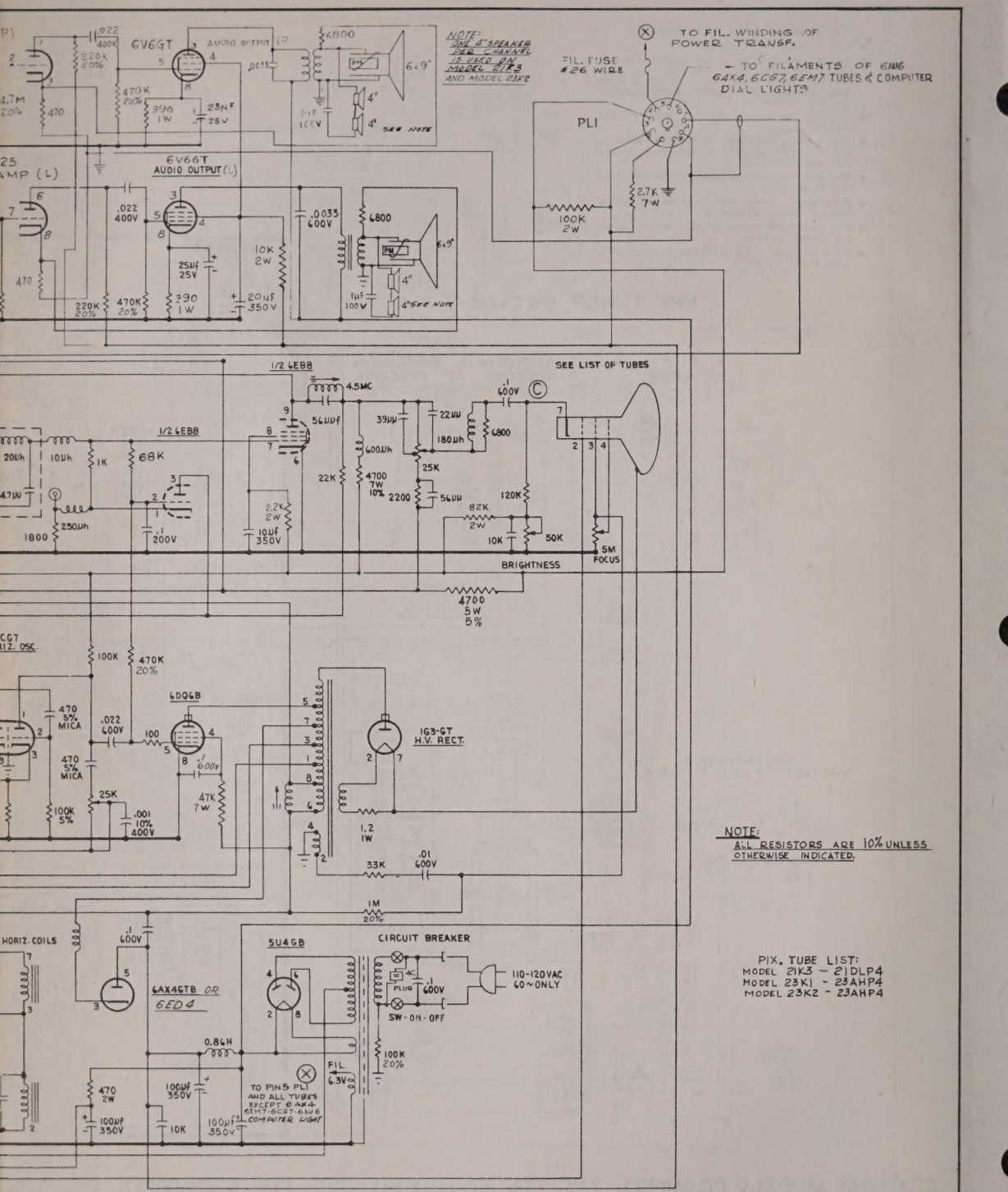
SET 526 FOLDER 14 -S



NOTE:
ALL RESISTORS ARE 10% UNLESS OTHERWISE INDICATED.

PIX. TUBE LIST:
MODEL 21K3 – 21DLP4
MODEL 23K1 – 23AHP4
MODEL 23K2 – 23AHP4

Schematic Diagram Courtesy of Packard Bell Electronics Corp.